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BULLETIN

OF THE

TORREY BOTANICAL CLUB

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CONTENTS

Some noteworthy lichens from Jamaica. (Plate 21.) LINCOLN W. RIDDLE. 321

A middle Eocene Goniopteris. (Plate 22.) . . EDWARD W. BERRY. 331

Notes on plants of the southern United States—III. FRANCIS W. PENNELL. 337

INDEX TO AMERICAN BOTANICAL LITERATURE. 363

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Vol. 44 No. 7

BULLETIN

OF THE

TORREY BOTANICAL CLUB

JULY, 1917

Some noteworthy lichens from Jamaica

LINCOLN W. RIDDLE

(WITH PLATE 21)

In the spring of 1912, Dr. Joseph A. Cushman, Assistant Curator of the Boston Society of Natural History, collected in the Island of Jamaica, in the West Indies, a set of lichens representing 109 species and varieties. A study of these has resulted in the discovery of two new species and of a number of other species of sufficient interest to be worthy of record. To the discussion of these species has been added a revision of the American species of *Megalospora*, four of which occur in Jamaica. A complete set of the lichens collected by Dr. Cushman has been deposited in the herbarium of the Boston Society of Natural History.

NEW SPECIES

1. **Buellia rinodinospora** Riddle, sp. nov.

Thallus epiphloeodes crustaceus uniformis effusus haud limitatus, albidus vel cinerascenti-albidus subnitidus, crassitudine mediocris, inaequalis partim rimulosus partim rimoso-areolatus et demum diffractus; KOH flavescens; hypothallo nullo. Apothecia mediocria, 0.5–1.0 mm. lata, subelevata, nitida, primum concava demum plana vel satis convexa, rotunda regularia; disco scabro, nudo, castaneo vel fusco-nigricante nunquam atro; margine proprio nigro, persistente, primum crasso integro demum tenue crenulato; epithecio fulvo; hymenio decolore, circ. 180 μ altit.; excipulo et hypothecio fusco-nigricante. Asci 8-spori. Sporae fuscae oblongae sat curvatae, biloculares placodiomorphae,

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loculis poro confluentibus, 36–50 × 15–20 μ. [PLATE 21, FIGS. 1, 4.]

On bark, Newcastle, Jamaica, March 1912, *J. A. Cushman 155*.

This species is distinct from all other *Buellias* in the large size and polar-bilocular character of the spores. Wainio (Act. Soc. Sci. Fenn. **7**: 172. 1890) describes a *Buellia placodiomorpha* with a similar type of spore but with four cells and reaching a size of only 19 × 10 μ. From species of *Rinodina*, this new species can be distinguished by the apothecia being of the lecideine type rather than the lecanorine.

2. **Chiodecton** (Sect. ENTEROGRAPHA) **leiostictum** Riddle, sp. nov.

Thallus crustaceus crebre contextus uniformis effusus, linea nigra limitatus, albidus vel demum sat sordide ochroleucus opacus, crassus (0.15–0.2 mm. crassit.) rimuloso-areolatus; KOH intense flavescens dein rubescens; hypothallo nullo. Apothecia numerosissima, thallo immersa, punctiformes rotundata vel subdifformia haud elongata, minuta, 0.12–0.16 mm. lata, seriata uniserialia vel interdum serie ramosa disposita serialibus rectis vel flexuosis, aut rarius partim irregulariter aggregata; disco atro parum pruinoso dein nudo, plano, superficiem thallo aequante; margine distincto nullo; epithecio fuligineo-nigro; amphithecio supra fuligineo-nigro infra decolore; hypothecio decolore; hymenio decolore, 100–120 μ altit. Asci 8-spori. Sporae decolores anguste oblongae, 5–8 loculares loculis cylindricis vel satis rotundatis, 20–30 × 4–6 μ, halonae 4–5 μ crasso indutae. [PLATE 21, FIGS, 3, 5.]

On old decorticated wood, Montego Bay, Jamaica, March 1912, *J. A. Cushman 15*.

In 1886 (Flora **69**: 104), Nylander published a list of the Graphidaceae collected by Charles Wright in Cuba. The list included many new species which were given merely as *nomina nuda*. For most of these no descriptions were ever published. The species just described was named by Nylander (*l.c.*) *Stigmatidium leiostictum*. Through the courtesy of Professor Farlow, I have been able to make a microscopic examination of original material of Wright's Graphideae Cubanae No. 157, cited by Nylander, and it has proved to be identical with the specimens collected by Dr. Cushman in Jamaica. Species of *Chiodecton* Sect. *Enterographa* with spores more than four-celled are com-

paratively few in number, and among these *Ch. leiostictum* is distinct in the serial arrangement of the punctiform apothecia.

NOTEWORTHY SPECIES NOT PREVIOULSY RECORDED FROM JAMAICA

1. ANTHRACOTHECIUM OCHRACEO-FLAVUM (Nyl.) Muell. Arg. Linnaea **43**: 44. 1880.

Verrucaria ochraceo-flava Nyl. Expos. Pyren. 50. 1858.

On bark, Montego Bay, *J. A. Cushman 122*. Known elsewhere from Cuba, Mexico, Colombia, and the East Indies.

2. HEUFLERIA SEPULTA (Mont.) Trevis. Flora **44**: 23. 1861.

Astrothelium sepultum Mont. Ann. Sci. Nat. Bot. II. **19**: 74. 1843.

On bark, Mandeville, *J. A. Cushman 152*. Known elsewhere from Cuba, Guiana, Brazil, and Peru.

3. LAURERA GIGANTOSPORA (Muell. Arg.) Zahlbr.; Engler & Prantl, Nat. Pflanzenfam. **I**[1*]: 71. 1903.

Bathelium gigantosporum Muell. Arg. Bot. Jahrb. **6**: 394. 1885.

On bark, Mandeville, *J. A. Cushman 44*. Known previously from the original collection only, made by Charles Wright in Cuba; but closely related and perhaps not specifically distinct from **Laurera megaspermum** (Mont.) Riddle, comb. nov. (*Trypethelium megaspermum* Mont. Ann. Sci. Nat. Bot. II. **19**: 68. 1843), which is known from Cuba, Guiana, and Brazil.

4. GRAPHINA CHRYSOCARPA (Raddi) Muell. Arg. Flora **63**: 41. 1880.

Opegrapha chrysocarpa Raddi, Atti Soc. Ital. Sci. **38**: 34. 1820.

On bark, Mandeville, *J. A. Cushman 49*. A striking species known elsewhere from Porto Rico, Costa Rica, Colombia, and Brazil.

5. GRAPHINA PLATYGRAPTA Muell. Arg. Flora **71**: 495. 1888.

On bark, Mandeville, *J. A. Cushman 54*. This species was based on material collected by Sintenis in Porto Rico, and hitherto has been known from the original collection only. Owing to the war, I have been unable to see the type, but the species has such

distinctive characters, and Mueller-Argau's description applies so well to Dr. Cushman's specimens, that there can be no doubt as to the identity of the two. *G. platygrapta* belongs to the section *Platygraphopsis* (see PLATE 21, FIGS. 2, 6). The original description gave the spore-measurements as 150 × 30 μ. I find that they vary from 150–180 × 30–50 μ. An examination of Wright's Graphideae Cubanae No. 4, labelled with a manuscript name of Nylander's in the Tuckerman Herbarium, proves that it is the same as Dr. Cushman's Jamaica specimens. This species is, therefore, now known from Cuba, Jamaica, and Porto Rico.

6. PHAEOGRAPHINA QUASSIAECOLA (Fée) Muell. Arg. Mem. Soc. Phys. Hist. Nat. Genève **29**[8]: 47. 1887.

Thecaria quassiaecola Fée, Essai Crypt. 97, *pl. 1, f. 16.* 1824.

This is a striking and peculiar species in which the prominent apothecia vary from elongated-lirelliform to oblong and even entirely circular. Occasional specimens occur with all the apothecia circular, and such specimens would easily be mistaken for a *Gyrostomum*. Mueller-Argau says (*op. cit.* 48) that Fée's citation of the type-locality as "America" must have been a mistake as the original specimen in Fée's herbarium came from Madagascar. And hitherto the species has been recorded from the Old World only: from tropical Africa, Ceylon, New Caledonia, and Australia. But it appears to be sufficiently common in Jamaica, as I have in my herbarium the following specimens from that island:—Mandeville, March, 1912, *J. A. Cushman 52;* also January, 1909, *A. E. Wight 66;* near Troy, September, 1906, *Elizabeth G. Britton & Delia W. Marble 265;* also June, 1909, *A. E. Wight 140a, 202, 208.* Furthermore, the specimen of Wright's Graphideae Cubanae No. 7, in the Tuckerman Herbarium, proves to be this species, having been incorrectly determined as "*Graphis scalpturata* var. *plurifera* Nyl." which is a synonym of *Phaeographina caesiopruinosa* (Fée) Muell. Arg. Both *Ph. scalpturata* and *Ph. caesiopruinosa* belong to the Section *Eleutheroloma*, in which the amphithecium is black at the sides only and colorless beneath; while *P. quassiaecola* belongs to the Section *Pachyloma*, in which the amphithecium is completely black and very thick at the base. With the correct identification of this Cuban specimen, we have three stations for the species in the West Indies.

7. LECANACTIS PREMNEA var. **plurilocularis** (Nyl.) Riddle, comb. nov.

Lecidea plurilocularis Nyl. Ann. Sci. Nat. Bot. IV. **15**: 49. 1861.

On bark, Montego Bay, *J. A. Cushman 67*. Known elsewhere from Cuba, Colombia, Peru, New Caledonia, the East Indies, and India.

8. **Ocellularia chionostoma** (Nyl.) Riddle, comb. nov.

Thelotrema chionostoma Nyl. Ann. Sci. Nat. IV. **19**: 329. 1863.

On bark, Montego Bay, *J. A. Cushman 106*. Known previously from the original collection only, made by Charles Wright in Cuba.

9. PHAEOTREMA PLATYCARPOIDES (Tuck.) Muell. Arg. Flora **69**: 311. 1886.

Thelotrema platycarpoides Tuck. Proc. Am. Acad. Arts Sci. **6**: 270. 1864.

On bark, Montego Bay, *J. A. Cushman 80*. Known previously from the original collection only, made by Charles Wright in Cuba.

10. **Lopadium castaneum** (Mey. & Flot.) Riddle, comb. nov.

Lecanora subfusca var. *castanea* Mey. & Flot. Nova Acta Acad. Caes. Leop. Carol. **19** (suppl. 1): 224. 1843.

On bark, Newcastle, *J. A. Cushman 29*. Known elsewhere only from Brazil.

11. PERTUSARIA VERRUCOSA (Fée) Mont. Ann. Sci. Nat. II. **19**: 78. 1843.

Trypethelium verrucosum Fée, Essai Crypt. 66. *pl. 18, f. 3*. 1824.

On bark, Newcastle, *J. A. Cushman 26*, and Mandeville, *J. A. Cushman 50*. Known elsewhere from Guadeloupe and Guiana.

12. RAMALINA PERUVIANA Ach. Lich. Univ. 599. 1810.

This species seems to be common in Jamaica. I have the following specimens in my herbarium: Mandeville, *A. E. Wight 95, 96; Elizabeth G. Britton 437; J. A. Cushman 47;* Catadupa, *J. A. Cushman 14*. I have compared one of the specimens collected by Wight with the type-specimens of Acharius in the Botanical Museum at Helsingfors, Finland, and the determination is certain. Known elsewhere from Porto Rico and Peru.

MEGALOSPORA

In an enumeration of Jamaica lichens in May, 1912, I described in Mycologia (**4**: 129) two new species of *Megalospora: M. Cummingsiae* and *M. jamaicensis*. The following autumn, I had an opportunity to study all of the material of this genus, including a number of authentic specimens in the collection of Mueller-Argau, at the Boissier Herbarium, Chambèsy, Switzerland. This led me to a detailed study of the principal species and as four of these occur in Jamaica it will not be out of place to present, herewith, the results of this study. Two of the species are variable but with well-marked varieties, which have been recognized by various authors and are certainly worthy of varietal names.

The genus *Megalospora* was established by Meyen and Flotow in 1843 (Nov. Act. Acad. Caes. Leop. Carol. **19** [suppl. 1]: 228), with *M. sulphurata* as the type-species. The species were included under *Lecidea* by Nylander; under *Patellaria* by Mueller-Argau; and under *Heterothecium* Sect. *Psorothecium* by Tuckerman. But in accordance with current ideas of the value of spore-characters in the classification of crustose lichens, Zahlbruckner (in Engler-Prantl, Nat. Pflanzenfam. **I**[1*]: 134. 1905) has revived *Megalospora* as a distinct genus, distinguished from the other Lecideaceae by the thick-walled, two-celled spores of large size. The commonest species is the variable *M. versicolor* (Fée) Zahlbr., of which many of the other proposed "species" are synonyms or varieties.

The following key and citations of species and synonymy will serve to summarize the results of my study of the American species and varieties of *Megalospora*.

A. Growing on evergreen leaves ..... 5. *M. premneella*
AA. Growing on the bark of trees.
B. Spores straight (PLATE 21, FIGS. 9, 10).
C. Thallus more or less straw-colored, apothecia with fulvous disk and straw-colored margin ..... 1. *M. sulphureorufa*
CC. Thallus ashy or whitish, apothecia variously colored, but the margin never straw-colored ..... (2. *M. versicolor*).
D. Margin white or pallid, contrasting with the fulvous, aeruginous, or black disk ..... 2b. *M. versicolor* var. *livido-cincta*
DD. Margin concolorous with the disk or nearly so, at least not pallid.
E. Apothecia variously colored: carneous, fulvous, aeruginous, or black, regular in form, and rarely over 1.5 mm. diam. 2a. *M. versicolor* var. *dichroma*

EE. Apothecia black and difform, reaching 3 mm. diam.
2c. M. versicolor var. *major*

BB. Spores curved.

C. Thallus smooth or granular, but not sorediate; spores 50–65 × 28–35μ, reniform, the individual cells little longer than wide (PLATE 21, FIG. 7.)
(3. *M. sulphurata*)

D. Thallus smooth or nearly so, apothecia 1.5–3 mm. diam.

E. Apothecia bay-brown to dark chestnut-brown, blackening only when old.....*3a. M. sulphurata* var. *genuina*

EE. Apothecia always black....*3b. M. sulphurata* var. *nigricans*

DD. Thallus granular-uneven, apothecia 3–6 mm. diam., blackening. *3c. M. sulphurata* var. *megacarpa*

CC. Thallus verrucose, granulate, and powdery-sorediate; spores 70–125 × 20–30 μ, the individual cells about twice as long as wide (PLATE 21, FIG. 8).....4. *M. Cummingsiae*

1. **Megalospora sulphureorufa** (Nyl.) Riddle, comb. nov.

Lecanora sulphureorufa (Nyl. Bull. Soc. Linn. Norm. II. **2**: 69. 1868.

Megalospora jamaicensis Riddle, Mycologia **4**: 129. 1912.

JAMAICA: Newcastle, *J. A. Cushman 24;* without definite locality, *Clara E. Cummings 138, 142.*

At the time that *M. jamaicensis* was published, I was sure that there was no American species to which the specimens so named could be assigned. But while working at the Boissier Herbarium, I found an authentic specimen of the plant called *Lecanora sulphureorufa* Nyl., based on three collections from two islands, New Caledonia and Lifu, situated between the Fiji Islands and Australia. This proved to be identical with my material from Jamaica. This is a remarkable distribution, and as the species is a conspicuous one, it seems extraordinary that it should never have been collected in South America, if it occurs there.

2. MEGALOSPORA VERSICOLOR (Fée) Zahlbr.; Engler & Prantl, Nat. Pflanzenfam. **I**^{1*}: 134. 1905.

Lecanora versicolor Fée, Essai Cryptog. 115. *pl. 28, f. 4.* 1824.

This species occurs in three varieties worthy of receiving names, as follows:—

2a. MEGALOSPORA VERSICOLOR var. **dichroma** (Fée) Riddle, comb. nov.

Lecidea dichroma Fée, Bull. Soc. Bot. Fr. **20**: 319. 1873. According to an authentic specimen in the Boissier Herbarium!

Lecidea incondita Krempelh. Flora **59**: 316. 1876. This was based on the same collection from Brazil (*Glaziou 5520*) as Fée's species.

Lecidea versicolor var. *vigilans* Nyl. Act. Soc. Sci. Fenn. **7**: 461. 1863 (in greater part). Not *Lecanora vigilans* Taylor, London Jour. Bot. **6**: 159. 1847! The type of Taylor's species is in the herbarium of the Boston Society of Natural History. There are two specimens, one from Mauritius and the other from Peru. But they represent two different species, and as the Mauritius specimen, which is cited first in Taylor's original description and should, therefore, be considered the actual type, is a species of *Bombyliospora*, the name *vigilans* Taylor can not be used in connection with *Megalospora versicolor*, even though the specimen from Peru belongs to that species. As the name *vigilans* has been used as a varietal name for both *Megalospora versicolor* and *M. sulphurata*, and is actually a *Bombyliospora*, it will make for clearness to drop it altogether.

According to Fée's original description of *Lecanora versicolor*, the var. *dichroma* corresponds to the typical form of the species, with the apothecia characteristically variable in color; but there is a tendency toward darkening, and the specimens having all the apothecia entirely black, but still small and regular, as is frequently the case, are to be considered merely as mature plants of this variety.

JAMAICA: without definite locality, *Clara E. Cummings 151, 153;* also in Merrill's Lich. Exsic. No. 230.

Specimens examined from Cuba, Porto Rico, Mexico, Costa Rica, Colombia, Venezuela, and Brazil (spec. authent.!); recorded also from Australasia and from Africa.

2*b*. MEGALOSPORA VERSICOLOR var. **livido-cincta** (Muell. Arg.) Riddle, comb. nov.

Patellaria livido-cincta Muell. Arg. Flora **64**: 227. 1881.

Patellaria versicolor var. *livido-cincta* Muell. Arg. Bull. Soc. Roy. Bot. Belgique **32**: 141. 1894.

Specimens examined from Mexico, Costa Rica, and Brazil (type!).

2*c*. MEGALOSPORA VERSICOLOR var. **major** (Wainio) Riddle, comb. nov.

Lecidea versicolor var. *major* Wainio, Act. Soc. Sci. Fenn. **7**[2]: 36. 1890. Authentic specimen examined from Brazil!

3. MEGALOSPORA SULPHURATA Mey. & Flot. Nov. Act. Acad. Caes. Leop. Carol. **19** (suppl. 1): 228. 1843.

The species is represented in America by three varieties, as follows:—

3*a*. MEGALOSPORA SULPHURATA var. **genuina** Riddle, nom. nov.

Patellaria sulphurata var. *vigilans* Muell. Arg. Flora **69**: 288. 1886. Not *Lecanora vigilans* Taylor (compare discussion given above under *M. versicolor* var. *dichroma*).

Apothecia primum pallida vel rufescentia vel tandem subnigrescentia.

According to an authentic specimen in the Boissier Herbarium, these are the characters of the original type-form of Meyen and Flotow.

JAMAICA: Gordon Town, 1884, *J. Hart.*

Specimens examined from Mexico, Colombia, Brazil, and the Philippines (spec. orig.!).

3*b*. MEGALOSPORA SULPHURATA var. **nigricans** (Muell. Arg.) Riddle, comb. nov.

Patellaria vigilans var. *nigricans* Muell. Arg. Flora **64**: 227. 1881.

Specimens examined from Mexico, Venezuela, Brazil (type!), and Australia.

3*c*. MEGALOSPORA SULPHURATA var. **megacarpa** (Nyl.) Riddle, comb. nov.

Lecidea megacarpa Nyl. Ann. Sci. Nat. IV. **11**: 260. 1859.

Specimens examined from Costa Rica, Brazil, Ceylon, and Mauritius (spec. authent.!).

4. MEGALOSPORA CUMMINGSIAE Riddle, Mycologia **4**: 129. 1912.

JAMAICA: without definite locality, *Clara E. Cummings 129* (type!). Endemic.

5. MEGALOSPORA PREMNEELLA (Muell. Arg.) Zahlbr.; Engler & Prantl, Nat. Pflanzenfam. I[1*]: 134. 1905.
Patellaria premneella Muell. Arg. Lich. Epiphyll. 5. 1890.
Specimen examined from Brazil (type!). Endemic.

Explanation of plate 21

All figures were drawn with a camera-lucida: FIGS. 1, 2, and 3, at a uniform magnification of 41 diameters; FIGS. 4–10, at a uniform magnification of 385 diameters. The plate has been reduced approximately one half in reproduction. Brown or black coloration is indicated by stippling.

FIG. 1. Vertical section of apothecium of *Buellia rinodinospora* Riddle.
FIG. 2. Vertical section of apothecium of *Graphina platygrapta* Muell. Arg.
FIG. 3. Vertical section of apothecium of *Chiodecton leiostictum* Riddle.
FIG. 4. Spores of *Buellia rinodinospora* Riddle.
FIG. 5. Spore of *Chiodecton leiostictum* Riddle, with mucous envelope.
Fig. 6. Spore of *Graphina platygrapta* Muell. Arg. (the cells semi-diagrammatic).
FIG. 7. Spores of *Megalospora sulphurata* Mey. & Flot.
FIG. 8. Spores of *Megalospora Cummingsiae* Riddle.
FIG. 9. Spores of *Megalospora versicolor* (Fée) Zahlbr.
FIG. 10. Spores of *Megalospora sulphureorufa* (Nyl.) Riddle.

A middle Eocene Goniopteris

EDWARD W. BERRY

(WITH PLATE 22)

The following new species, based upon rather extensive and well preserved material from the middle Eocene of our southern states, seems worthy of special notice. It is referred to the polypodiaceous genus *Goniopteris* Presl, as amended, and it is hoped that the present note will have some influence with students of living ferns in hastening the much to be desired segregation of the unwieldy and more or less unnatural genus *Dryopteris*, in which *Goniopteris* is often included.

Goniopteris claiborniana sp. nov.

Fronds of large size, probably bipinnate, with a stout prominently winged rachis. Pinnae alternate to subopposite, often prevailingly subopposite. Pinnae shortly stipitate, of large size, linear-lanceolate in outline, averaging between 10 cm. and 15 cm. in length by 1.5–3.5 cm. in maximum width, tapering to an extended, attenuated, acuminate tip. Pinnae variable, normally not entirely segregated into individual pinnules but pinnatifid, the margins being separated into dentate, inequilateral segments with upwardly directed points and narrow, inequilateral sinuses extending one fourth to one third of the distance to the stipe. Pinnae sometimes but slightly pinnatifid with short, conical segments, the sinuses extending only one seventh of the distance to the stipe; sometimes deeply pinnatifid, the sinuses extending about half way to the stipe. Basal proximal pinnule often free and entire.

The three types of marginal lobulation are correlated with three types of venation, although naturally the three are connected by every intermediate gradation. These types will be described after describing what I have called the normal type. This is the type that agrees in its more important particulars with that type familiar in Tertiary ferns and referred by paleobotanists to the more or less interrelated and synonymous genera *Lastrea*, *Phegopteris* and *Goniopteris*. It is a type met with in modern,

mostly tropical, ferns, variously segregated or aggregated by students of existing ferns in the genera *Lastrea*, *Nephrodium*, *Phegopteris*, *Polybotrya* and *Dryopteris*.

Christensen, perhaps the foremost living fern student, enumerates upwards of one thousand existing species which he refers to *Dryopteris*. These are segregated into ten groups termed subgenera, although most of them are admittedly of generic rank. These groups of species are named *Eudryopteris*, *Stigmatopteris*, *Ctenitis*, *Lastrea* Bory (emended), *Glaphyropteris* Presl, *Steiropteris*, *Cyclosorus* Link (emended), *Leptogramma* J. Sm., *Goniopteris* Presl (emended), and *Meniscium* (Schreber).

The fossil species here described belongs to this author's ninth subgenus, the emended *Goniopteris* of Presl, which I am recognizing as a valid genus, since the data which paleobotany furnishes to recent botany are obscured by the use of generic names that denote composite aggregations of living species like so many of the fern genera in Die Natürlichen Pflanzenfamilien. *Goniopteris* as delimited by Christensen* has about three score, mainly American tropical species, although it is represented in the Old World by at least two species of Africa, Asia and Australia. It is an eminently natural group that has evidently inhabited southeastern North America since the middle Eocene.

The present type belongs with those fossil forms characterized by a single well marked lateral running to the tip of each lateral lobule and these laterals are more often opposite or subopposite than alternate. Each lateral diverges from the midrib of the pinna at an angle of about sixty degrees and gives off, alternately proximad and distad, simple branches, averaging about eight to ten to a side. The basal distal tertiary of one lateral unites with the basal proximal tertiary of the adjacent superior lateral somewhat above the median point between the two laterals. This united vein, termed a ray by Ettingshausen, proceeds in a flexuous course to the marginal sinus, uniting alternately with the distal and proximal tertiaries from the adjacent laterals. In the marginal lobe there are several simple and free tertiaries, usually three or four running to the distal margin and four to six running to the

* Christensen, Carl. On a natural classification of the species of *Dryopteris*. Biologiske Arbeijder Tilegnede Eug. Warming, 73–85. N 1911.

longer because more arched proximal margin. This type of venation is the prevailing type in the specimens collected and is shown in FIG. 3.

The pinnae with the reduced marginal lobulation have an essentially similar venation to that just described. The laterals are more nearly at right angles with the midrib and the tertiaries number ten or eleven, alternating, rather straight pairs; those from adjacent laterals uniting midway between to form a ray that is rather straighter than in the previous case. Each ray terminates at a sinus and there are usually three pairs of free simple veinlets in each lobule, although two or four pairs may be present at times.

In the pinnae that are deeply pinnatifid, the venation, while of the same general plan as in the preceding cases, varies in certain rather remarkable particulars which serve to distinguish the present form from all other previously described fossil species. Only one, two or three tertiaries from each adjacent lateral are concerned in the formation of a principal ray that runs to the sinus of the margin, and one or the other of these tertiaries may fork, the branch uniting with a branch from the next tertiary, the resultant subsidiary vein or ray uniting with the principal ray near the sinus, the two enclosing a laterally elongated rhomboidal areola. The free veinlets are only from one to three terminal pairs; all of the other tertiaries are at least once forked at a greater or less distance above their base, each limb of the fork uniting with a corresponding fork of the next adjacent tertiary, the resulting ray running directly to the margin. This is the *Goniopteris-Aspidii* type of venation of Ettingshausen's Farnkräuter der Jetzwelt (1865).

The venation of this type is still farther complicated by the frequent presence of a very fine subsidiary branch from one or the other forks of a tertiary, and this fine branch runs directly to the margin. This type of venation is shown in FIG. 4.

The principal intermediate type is one in which only a few of the forks of the tertiaries unite with their adjacent fellows from the adjacent tertiaries to form a ray, the majority of the tertiaries being simply once forked with both branches of such forks terminating in the margin.

This handsome and characteristic species is common in the

clays of the Yegua formation at Columbia, Louisiana, occurring also in the sandy clays of the Lisbon formation near Newton, Mississippi, but none of the collected material is in fruit. The form and venation are so well marked and distinctive, however, that the species is at once correlated with the rather abundant Tertiary type that, under the name of *Goniopteris*, *Lastrea* or *Phegopteris*, is so characteristic of the fern floras of that time. It is at once distinguished from all of these by the peculiar venation, otherwise it shows the same habit, winged rachis and outline as, for example, *Lastrea stiriaca* Heer* of the European Oligocene, described originally by Unger† as *Polypodites*, referred to *Goniopteris* by Alexander Braun‡ and to *Phegopteris* by Ettingshausen.§

There are at least fifteen known Tertiary species of this general type, most of which are European, although several have been recorded from American localities. Most of the foreign material is somewhat younger than the present species, although two different forms have been described from the middle Bagshot beds of southern England, a nearly homotaxial (Lutetian) horizon.

Several early Eocene species have been recorded in this country from the Rocky Mountain region. In addition to the differences in venation previously referred to, *Lastrea intermedia* Lesquereux‖ from the Denver formation has the pinnae decurrent on the main stipe; *Lastrea Goldiana* Lesquereux¶ from the same horizon has crenulate and deeply divided margins and simple tertiaries; the form from Sand Creek, Colorado, referred to Ettingshausen's Monte Promina species *Lastrea polypodioides***, has a denticulate margin and simple tertiaries. The form from the lower Eocene of Oregon identified by Newberry as *Lastrea Knightiana*†† and commonly referred to the European early Miocene species *Lastrea Fischeri* Heer‡‡ is much like the present species in size and general

* Heer, Fl. Tert. Helv. **1**: 31. *pl. 7, 8.* 1855; **3**: 151. *pl. 143.* 1859.

† Unger, Chlor. Protog. 121. *pl. 36.* 1847.

‡ Braun, Zeits. Deutsch. Geol. Gesell. **4**: 556. 1852.

§ Ettingshausen, Foss. Fl. Bilin. **1**: 16. *pl. 2, f. 16–18.* 1866.

‖ Lesquereux, Tertiary Flora, 56. *pl. 4, f. 14.* 1878.

¶ Idem, *f. 13.*

** Idem, 57. *pl. 4, f. 11, 12.*

†† Newberry, Proc. U. S. Nat. Mus. **5**: 503. 1882.

‡‡ Heer, Fl. Tert. Helv. **1**: 34. *pl. 9, f. 3.* 1855; Lesquereux, Cret. & Tert. Fl. 239. *pl. 50, f. 1, 1a.* 1883; Newberry, Mon. U. S. Geol. Surv. **35**: 10. *pl. 48, f. 6.* 1898.

appearance, but differs in venation. The American material of this last species is rather poor and I doubt very much its identity with the European type. A very widespread Tertiary type of fern liable to be confused with the *Goniopteris* is *Osmunda lignitum* Stur* in which, however, the tertiaries are all always simple, neither anastomosing nor forming interlateral rays.

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Explanation of plate 22

GONIOPTERIS CLAIBORNIANA Berry

From the Eocene of Columbia, Louisiana.

FIG. 1. Portion of a pinna, natural size.

FIG. 2. Fragment of a frond, natural size.

FIG. 3. Normal type of venation, × 4.

FIG. 4. Unusual type of venation, × 4.

* Stur, Jahrb. k. k. Geol. Reichs. **20**: 9. *pl. 2.* 1870.

Notes on plants of the southern United States—III

FRANCIS W. PENNELL

As with preceding issues this paper divides itself into two portions. One consists of short notes based upon the writer's field work of 1912 and 1913, recording mostly plants believed new to their respective states. The other and larger portion consists of a revision of the genus *Chamaecrista* in the United States, and for this have been reviewed, besides his own collections, all the material in several of our leading herbaria. In both parts symbols are used; > to indicate in flower; <, in fruit.

MISCELLANEOUS SPECIES

ARISTOLOCHIA LONGIFLORA Engelm. & Gray

Not "*A. longifolia*," as it appears in Coulter, Botany of Western Texas (Contr. U. S. Nat. Herb. **2**), and in Small, Flora of the Southeastern United States. Collected near its original station, on dry black loam, Edwards Plateau, northwest of New Braunfels, Comal County, Texas, September 14, 1913, *5435*.

ACTAEA ALBA (L.) Mill.

Deciduous woodland, Catalpa, West Feliciana Parish, Louisiana, August 22, 1912, *4309*. With a large number of northern species, such as *Asplenium pycnocarpon* Spreng., this reaches its southern limit in the loess hills east of the Mississippi River in Louisiana.

CRACCA AMBIGUA (M. A. Curtis) Kuntze

Open long-leaf pine-land, one to two miles north of Abita Springs, St. Tammany Parish, Louisiana, > August 12, 1912, *4136*.

Cracca angustifolia (Featherman) Pennell, comb. nov.

Tephrosia angustifolia Featherman, Bot. Rep. Louisiana 73. 1871.

"Habitat.—Pine barrens near Pontchatoula [Louisiana]." From inquiry at Baton Rouge it seems probable that Featherman's type is not in existence.

Cracca onobrychoides (Nutt.) Kuntze as it occurs in central and western Arkansas and eastern Oklahoma is relatively a stout plant, its stem and leaf-rhachises hirsute with more or less spreading rusty hairs, its leaflets mostly nine to twelve pairs, elliptic-oblong, densely and softly pubescent beneath. The plant here considered, for which is taken up Featherman's name, is more slender, its stem and leaf-rhachises shortly pubescent with appressed or but slightly spreading hairs, giving by their more scattered position the effect of being less rusty, its leaflets six to nine pairs, linear-oblanceolate. This is probably a characteristic plant of the long-leaf pine-land in Louisiana and Mississippi; we have it from Gulfport, Harrison County, Mississippi, < September 8, 1900, *F. E. Lloyd & S. M. Tracy 161*, and from open pine-land, one to two miles north of Abita Springs, St. Tammany Parish, Louisiana, < August 14, 1912, *4189*. Its specific status is here proposed tentatively. Specimens of *C. onobrychoides* collected on prairies in Bowie County, Texas, in 1898, *H. Eggert*,and at Hempstead, Waller County, Texas, *E. Hall 119*, in pubescence and leaf-form show possible first stages of transition toward *C. angustifolia*. The plant needs further field-study.

EYSENHARDTIA TEXANA Scheele

The single species of *Eysenhardtia* occurring through most of central southern Texas is this, based upon Lindheimer's collection at New Braunfels, Texas. It has been confused with the central Mexican *E. polystachya* (Ortega) Sargent (*E. amorphioides* H.B.K.), but is a smaller plant, a shrub rather than a small tree, its leaflets fewer in number, finely puberulent rather than pubescent, its calyx-tube split on posterior side relatively more deeply and its legumes smaller, evidently upcurved, at maturity ascending, not reflexed. Mr. W. E. Safford and the writer are planning a revision of this small but neglected genus. On black calcareous soil, Edwards Plateau, northwest of New Braunfels, Comal County, Texas, > September 14, 1913, *5468*.

ZORNIA DIPHYLLA (L.) Pers.

Sandy soil, one mile east of Aloe, Victoria County, Texas, > September 18, 1913, *5491*. A tropical species, West Indian and

Mexican, extending into southern Arizona, but, so far as I am aware, not before reported from the Gulf States.

LESPEDEZA HIRTA (L.) Ell.

Dry sandy oak-woods west of Sheridan, Colorado County, Texas, collected ≷ September 21, 1913, *5523*.

GALACTIA MARGINALIS Benth. Ann. Wien. Mus. **2**: 126. 1838

Perhaps *G. heterophylla* (Gill.) Vail (Bull. Torrey Club **22**: 502. 1895), but not *G. heterophylla* A. Gray (Boston Jour. Nat. Hist. **6**: 171. 1850).

Sandy soil, one mile east of Aloe, Victoria County, Texas, > September 18, 1913, *5497*.

THE GENUS CHAMAECRISTA MOENCH IN THE UNITED STATES

During my two southern trips especial attention was given to the genus *Chamaecrista* Moench. This genus or, if you will, subgenus of *Cassia* L. has long been known as of particular taxonomic difficulty. As long ago as 1871 Bentham in his revision of *Cassia* emphasized this. Hence it has seemed desirable to see living plants and to study the behavior of the several species.

From the following lists the extent and deficiencies of this field-work will be apparent. I have collected nearly all the species in my course, but, as I did not travel west of central Texas or south into the Florida peninsula, I have seen but six of the thirteen species here recognized.

However, these six include all of the wide-ranging, widely variable sorts, and, as in this genus the characters of diagnostic value preserve well, the main importance of field-study has been to form some appraisement of variation within and between species. Of the geographic subspecies here treated, six in all, the writer has collected three.

Corolla large, exceeding 1 cm. in diameter; one petal only moderately longer than remaining four. Stamens 10. Pedicels 1–8, 7–40 mm. long.

Perennials.

Petiolar gland slender-stalked.

Leaflets 7–9 mm. long, rounded-mucronulate,

glabrous, reddish beneath. Pedicels 30–40 mm. long. Sepals ovate. Legumes 30–40 mm. long, finely appressed-puberulent. 1. *C. Wrightii.*

Leaflets 8–11 mm. long, acute-mucronate, ciliate, green beneath. Pedicels 7–9 mm. long. Sepals lanceolate-attenuate. Legumes 35–40 mm. long, strigose. 2. *C. aristellata.*

Petiolar gland sessile.

Pedicel 1, 25–35 mm. long, exceeding the leaves. Sepals ovate. Stipules ovate. Leaflets strongly ridge-veined. 3. *C. texana.*

Pedicels 1–4, 15–25 mm. long, shorter than the leaves. Sepals lanceolate. Stipules lanceolate-linear. Leaflets not strongly ridge-veined.

Leaflets 4–7 pairs, not ridge-veined, pubescent. Petiolar gland small. Pedicels spreading-pubescent. Legumes 3.5–4 cm. long, pubescent. 4. *C. keyensis.*

Leaflets 12–20 pairs, finely ridge-veined, glabrous. Petiolar glands large, 1–2 mm. long. Pedicels glabrous to finely appressed-puberulent. Legumes 6.5–8.5 cm. long, sparsely finely appressed-puberulent. 5. *C. Deeringiana.*

Annuals.

Petiolar gland depressed, 1–2.5 mm. wide. Pedicels glabrous to more rarely puberulent in lines. Leaflets 10–25 pairs. 6. *C. brachiata.*

Petiolar gland not depressed, 0.07–1.5 mm. wide. Pedicels puberulent to hirsute. Leaflets 6–12(–18) pairs. Species closely related and more or less intergrading.

Leaflets glabrous (occasionally slightly puberulent in *C. fasciculata*). Legumes 3–7 cm. long, 5–7 mm. wide.

Anther-sacs purple. Petiolar gland minute, 0.07–0.2 mm. wide. Leaflets 5–9 pairs. Buds ovate, acute to short-acuminate. Legume relatively long-beaked. Pedicels appressed-pubescent. Plant low. 7. *C. rostrata.*

Anther-sacs yellow (rarely purplish in *C. fasciculata*). Petiolar gland 0.5–1.5 mm. wide. Leaflets 6–12(–18) pairs. Buds lanceolate to ovate-lanceolate, strongly acuminate. Legumes relatively short-beaked.

Pedicels and stems pubescent with in-

curved hairs. Legumes pubescent with relatively short and appressed hairs. Leaflets 6–12(–15) pairs. Corolla 25–30 mm. wide. 8. *C. fasciculata.*

Pedicels and stems hirsute with spreading hairs. Legumes pubescent with spreading hairs.

Leaflets 9–18 pairs, 15–20 mm. long. Corolla mostly 30–40 mm. wide. Stems stout, erect. 8a. *C. fasciculata β.*

Leaflets 6–10 pairs, 8–12 mm. long. Corolla about 25 mm. wide. Stems slender, spreading. 8b. *C. fasciculata γ.*

Leaflets pubescent with incurved hairs.

Anther-sacs yellow. Legumes 3–5 cm. long, 5 mm. wide. Plants relatively small-leaved, slender and spreading.

Pedicels and legumes pubescent with incurved hairs. 9. *C. mississippiensis.*

Pedicels and legumes pubescent with spreading hairs. 9a. *C. mississippiensis β.*

Anther-sacs purple. Legumes 5–6 cm. long, 4–5 mm. wide. Plant relatively large-leaved, stouter and erect. 10. *C. puberula.*

Corolla small, less than 1 cm. in diameter; one petal much larger than the remaining four. Stamens 5–9. Pedicels 1–2(–3), 2–5 mm. long. Annuals.

Legumes 3–4 mm. wide, 10- to 18-seeded. Leaflets long-ciliate. Odd petal not twice length of others. 11. *C. lepladenia.*

Legumes 4–6 mm. wide, 6- to 9-seeded. Leaflets not ciliate.

Petiolar gland with discoid head much wider than stalk-like base. Corolla with odd petal twice exceeding others. Legumes 7- to 9-seeded, pubescent with incurved (rarely spreading) hairs. Stem pubescent with ascending-incurved, rarely with spreading hairs.

Leaflets glabrous, obtuse, mucronate. Sepals puberulent on midrib. Stipules 5–8 mm. long.

Leaflets 9–18 pairs, 2–4 mm. wide. 12. *C. nictitans.*

Leaflets 15–26 pairs, 1–2 mm. wide. 12a. *C. nictitans β.*

Leaflets pubescent with incurved hairs, acutish to acute, more conspicuously mucronate-tipped. Sepals pubescent on midrib. Stipules 8–10 mm. long. 12b. *C. nictitans γ.*

Petiolar gland with head but slightly wider than stalk-like base. Corolla with odd petal less

than twice exceeding others. Legumes 6- .o 7-seeded, hirsute with spreading hairs. Stem, at least above, hirsute with spreading hairs. Leaflets 15–27 pairs. Stout, erect, mostly hirsute throughout. 13. *C. aspera.*

Leaflets 9–18 pairs. Slender, diffuse, mostly hirsute only above. 13*a*. *C. aspera* β.

1. **Chamaecrista Wrightii** (A. Gray) Pennell, comb. nov.

Cassia (*Chamaecrista*) *Wrightii* A. Gray, Pl. Wright. **2**: 50. Mr 1850.

"Hill-sides, on the Sonoita, near Deserted Rancho, Sonora; Sept. [C. Wright] (1034)." Co-types seen in the herbarium of Columbia University at the New York Botanical Garden and in the herbarium of the Academy of Natural Sciences of Philadelphia.

Perennial. Stem ascending, 3–4 dm. tall, finely puberulent in lines with incurved to appressed hairs. Stipules lanceolate-acuminate, very shortly or not ciliate, 3–4 mm. long. Petioles 3–4 mm. long, slightly puberulent. Petiolar gland single, below proximal leaflets, conspicuously stalked, discoid, 0.15–0.2 mm. wide, dark-brown. Leaflets six to eight pairs, 8–10 mm. long, 2 mm. wide, obliquely ellipsoid-lanceolate, rounded, very shortly mucronulate, glabrous, not ciliate, obscurely nerved. Pedicel one, 30–40 mm. long, sparingly puberulent in lines with incurved hairs. Sepals 7 mm. long, ovate, acute. Petals 10–12 mm. long, the anterior slightly exceeding the laterals. Stamens ten, unequal, two longer; anthers 6–8 mm. long, gradually narrowed above, yellow (?). Legumes 4 cm. long, 5 mm. wide, sparingly finely appressed-puberulent. Seeds eight.

"Hill-sides," northeastern Sonora and southern Arizona.

ARIZONA. Without definite locality, *J. T. Rothrock*, 1874, 4750 ft. alt. (U).

2. **Chamaecrista aristellata** Pennell, sp. nov.

Cassia aristellata A. Gray, manuscript name on sheet here taken as type.

Perennial. Stem ascending, 4 dm. tall, puberulent with incurved hairs and hirsute with interspersed longer spreading hairs. Stipules lanceolate-acuminate, long-ciliate, 5 mm. long. Petioles 3–5 mm. long, hirsute. Petiolar gland single, slightly below proximal leaflets, conspicuously slender-stalked, discoid, 1–1.5 mm. wide. Leaflets six to eight pairs, 10–15 mm. long, 2 mm.

wide, oblique-lanceolate, falcate, acuminate-mucronate on distal side, nearly glabrous, evidently ciliate, evidently nerved. Pedicel one, 7–13 mm. long, appressed-puberulent with incurved hairs. Sepals 10–11 mm. long, lanceolate, acuminate, puberulent. Petals 10 mm. long, the anterior slightly exceeding the lateral. Stamens unequal. Legumes 4 cm. long, 4–4.5 mm. wide, strigose-hirsute, brown. Seeds twelve, 2–2.2 mm. long, oval.

Type, "Texano-Mexicanum," collected in fruit, *Berlandier 2036*, in the herbarium of Columbia University at the New York Botanical Garden.

Apparently differs from *Chamaecrista calycioides* (DC.) Greene of South America, with which it has been confused, by its fewer leaflets and solitary flowers; doubtless, when *C. calycoides* is recollected and fully described, by other characters.

Besides the type collection, the precise locality of which is unrecorded, seen also from Cameron County, Texas, > May 8, 1900, *Vernon Bailey 231*, in the United States National Herbarium.

3. **Chamaecrista texana** (Buckl.) Pennell, comb. nov.

Cassia texana Buckl. Proc. Acad. Nat. Sci. of Phila. **1861**: 452. 1862. "Sandy soil, Bastrop Co., Texas." Type seen in the herbarium of the Academy of Natural Sciences of Philadelphia.

Perennial, from a rhizome. Stems ascending, 2–4 dm. long, puberulent in lines with ascending-incurved hairs. Stipules cordate-triangular, acuminate, slightly ridge-veined, puberulent, ciliate, 3–4 mm. long. Petioles 2–3 mm. long, puberulent with ascending-incurved hairs. Petiolar gland single, below proximal leaflets, sessile, rudimentary or mostly wanting. Leaflets ten to sixteen pairs, crowded, 6–8 mm. long, 1 mm. wide, elliptic-lanceolate, acutish, pubescent, finely ciliate, strongly ridge-veined. Pedicel one, exceeding the subtending leaf, in fruit 30–50 mm. long, puberulent with incurved hairs. Sepals 7–8 mm. long, ovate, acute, finely appressed-puberulent. Petals 10–13 mm. long, the anterior slightly exceeding the laterals. Stamens ten, unequal, one or two longer; anthers 6 mm. long, yellow. Legumes 3–4 cm. long, 5 mm. wide, sparingly finely appressed-pubescent. Seeds eight.

This has been identified as *C. chamaecristoides* and as *C. procumbens*.

C. chamaecristoides (Collad.) Greene, of South America, differs by its longer stouter stems, lanceolate stipules, slightly longer

petioles, evident stalked petiolar gland, rounded not winged leaf-rachis (in *C. texana* this is flattened, slightly winged), larger scarcely veined evidently cuspidate leaflets, stouter densely puberulent pedicels shorter than the subtending leaves, and flowers larger, 30–35 mm. in diameter.

C. micrantha Britton ("*C. procumbens*," not L.), of Cuba and the Isle of Pines, differs by its ovate-lanceolate stipules, evident petiolar gland, terete not winged leaf-rachis, shorter scarcely veined usually more puberulent to pubescent leaflets, peduncles becoming but 10–20 mm. long, smaller flowers 15 mm. in diameter, and more puberulent eight- to twelve-seeded legumes.

Dry sandy soil, southern Texas.

TEXAS. Bastrop:* *S. B. Buckley* (A). Cameron: Rudolph, *F. L. Lewton 178* > April 13 (U). Duval: Pena, *G. C. Nealley 117* (P, U). Victoria: Aloe, *F. W. Pennell 5496* > September 18 (P). Webb: Laredo, *Schott 105* > June (Y). Also "De Matamoros a las Nueces," *Berlandier 2427* (A, U, Y).

4. **Chamaecrista keyensis** Pennell, sp. nov.

Perennial. Stems spreading, 1–8 dm. long, densely pubescent with spreading hairs. Stipules lanceolate-acuminate, 4.5–5 mm. long. Petioles 3–6 mm. long, densely spreading-pubescent. Petiolar gland single, toward distal end of petiole, sessile, more or less raised, saucer-shaped. Leaflets four to seven pairs, 7–10 mm. long, 2–4 mm. wide, oblanceolate, mucronate, densely pubescent with somewhat incurved hairs. Pedicels one or two, 15–20 mm. long, pubescent with spreading upcurved hairs. Sepals 8–9 mm. long, lanceolate-acuminate, hirsute. Petals 9–10 mm. long, the anterior but slightly exceeding the laterals. Stamens ten, unequal; anthers 7–8 mm. long, gradually narrowed above, reddish-purple. Legumes 4–4.5 cm. long, 4–5 mm. wide, puberulent with incurved hairs. Seeds twelve, 3 mm. long.

Type, rocky pine woods, Big Pine Key, Monroe County, Florida, collected in flower May 2, 1917, *F. W. Pennell 9553* in the herbarium of the New York Botanical Garden.

The Antillean *C. grammica* (Spreng.) Pollard, with which this has been identified, differs by its appressed pubescence and conspicuously stalked glands.

* As in preceding lists, one specimen (rarely several) from a county is cited, county-names being arranged alphabetically. For herbaria cited see Bull. Torrey Club **43**: 94. 1916.

Rocky or sandy pine-lands, Florida Keys.

FLORIDA. Monroe: Big Pine Key, *J. K. Small 3785, 3790* <November 17 (Y); No-name Key (U, Y); Ramrod Key (Y).

5. **Chamaecrista Deeringiana** Small & Pennell, sp. nov.

Perennial, from a horizontal rhizome. Stems erect, slender, purple or purplish, 3–6 dm. tall, glabrous or sparingly puberulent above with incurved hairs. Stipules strongly ridge-veined, glabrous, 7–10 mm. long. Petioles 5–8 mm. long, sparingly appressed-puberulent to glabrous. Petiolar gland single, depressed-discoid, 1–1.5 mm. wide, brown. Leaflets 10–20 pairs, 10–20 mm. long, 2–3 mm. wide, lanceolate-linear, acute-mucronate, glabrous, not ciliate, shining, finely ascending ridge-nerved; midrib excentric. Pedicels one to four in a fascicle, 10–20 mm. long, very slender, glabrous to more rarely sparingly puberulent in lines with incurved hairs. Sepals 10–12 mm. long, lanceolate, acuminate, not dilated nor white-margined below, glabrous to finely pulverulent. Petals 14–18 mm. long, anterior slightly exceeding laterals. Stamens ten, unequal, 2 longer; anthers 8–9 mm. long, yellow or reddish. Legumes 6.5–8.5 cm. long, 5 mm. wide, 1 mm. thick, brown, thick-walled (seed-cavities scarcely visible externally), sparingly finely appressed-puberulent to glabrous. Seeds twelve to fifteen, 3.8–4 mm. long, dark purplish-brown.

Type, pine-lands near Silver Palm, Dade County, Florida, collected in flower and fruit June 22, 1915, *J. K. Small, C. A. Mosier & G. K. Small 6454*, in the herbarium of the New York Botanical Garden.

Has been confused with *C. brachiata*.

Pine-lands on Miami limestone, mainland, and on Big Pine Key, southern Florida.

FLORIDA. Dade: Brogdon Hammock; Cocoanut Grove; Cutler; Homestead; Long Prairie; Miami, *N. L. Britton 197* > March 24 (Y); Murden Hammock; Silver Palm; near Timms Hammock, *F. W. Pennell 9540* > April 28 (Y). Monroe: Big Pine Key, *J. K. Small 3781* ≷ November 17, (Y).

6. CHAMAECRISTA BRACHIATA Pollard

Chamaecrista brachiata Pollard, Proc. Biol. Soc. Wash. **15**: 20. Feb. 18, 1902. "Type, No. 330,115, in the United States National Herbarium, collected by Charles L. Pollard and G. N.

Collins at Miami, Dade County, Florida, April 4–7, 1898 (No. 245)." Type seen in the United States National Herbarium.

Annual. Stems erect, 8–12 dm. tall, glabrous or sparingly puberulent above with incurved hairs. Stipules lanceolate-acuminate, glabrous or nearly so, not ciliate, 5–8 mm. long. Petioles 4–8 mm. long, sparingly appressed-puberulent to glabrous. Petiolar gland single, or occasionally two or three and serially placed, closely sessile, effused-discoid to saucer-shaped, 1–2.5 mm. wide, brown. Leaflets ten to twenty-five pairs, 10–20 mm. long, 2–3 mm. wide, linear-lanceolate, acute-mucronate, glabrous, not ciliate, obscurely nerved. Pedicels 1–4 in a fascicle, 10–20 mm. long, glabrous to more rarely sparingly puberulent in lines with incurved hairs. Sepals 10–12 mm. long, lanceolate, acuminate, glabrous or nearly so. Petals 10–18 mm. long, anterior slightly exceeding laterals. Stamens ten, unequal, 2 longer; anthers 7–9 mm. long, reddish to purplish (?). Legumes 6–8 cm. long, 5–5.5 mm. wide, sparingly finely appressed-puberulent. Seeds fifteen to eighteen, 3–3.2 mm. long, dark brown.

Dry pine-land, peninsular Florida (perhaps also in southern Alabama).

FLORIDA. Brevard: Merritt's Island, *A. A. Baldwin 23* < September 1 (A). Dade: Miami, *C. L. Pollard & G. N. Collins 245* < April 4–7 (U, Y). Duval: Jacksonville, *A. H. Curtiss 5156* > August 27 (U, Y). Hillsboro: Tampa, *N. L. Britton & P. Wilson 7* ≷ August 25 (Y). Lake: Eustis, *G. V. Nash 701* > May 1–15 (U, Y). Lee: Pine Island, *S. M. Tracy 7242* > May 14 (P, U, Y). Manatee: Bradentown, *S. M. Tracy 7089* > June 15 (P, U, Y). Marion: Fort King, *Lieut. Alden* (Y). Orange: Clarcona, *M. Meislahn 127* ≷ November 30 (U). Pinellas: Clearwater Key, *S. M. Tracy 6536* > April 21 (U). Polk: Lakeland, *Mrs. T. Meehan* ≷ March (A). Ste. Lucie: Fort Pierce, *A. B. Burgess 724* > April 8–9 (Y). Suwanee: Live Oak, *F. W. Pennell 9799* > May 23 (Y).

(?) ALABAMA. Baldwin: Bay Minette, *J. M. Macfarlane & O. Goertz* > June 15 (P), apparently this, but petiolar gland is quite small.

7. CHAMAECRISTA ROSTRATA Wooton & Standley

Chamaecrista rostrata Wooton & Standley, Contrib. U. S. Nat. Herb. **16**: 135. F 12 1913. "Type in the U. S. National

Herbarium, no. 660032, collected in sandy soil at Logan [New Mexico], October 5, 1910, by Mr. Geo. L. Fisher (no. 93)." Type seen in United States National Herbarium.

Annual. Stem erect, 1–3 dm. tall, branched, finely puberulent over entire surface with ascending-incurved hairs. Stipules lanceolate-attenuate, glabrous or nearly so, slightly ciliate, nerved, 4–6 mm. long. Petioles 2–4 mm. long, finely puberulent with incurved hairs. Petiolar gland single, toward distal end of petiole, sessile, slightly saucer-shaped, 0.07–0.2 mm. wide, brown. Leaflets five to nine pairs, 7–12 mm. long, 2–3 mm. wide, oblong, obtuse, shortly mucronulate, glabrous, scarcely finely ciliolate, paler beneath, faintly nerved. Bracteoles 2–3 mm. long, lanceolate-attenuate. Pedicels one or two in a fascicle, 7–10 mm. long, finely puberulent with incurved hairs. Sepals 7–10 mm. long, ovate-acuminate, puberulent on the midrib. Petals 10–15 mm. long, ovate-acuminate, puberulent on the midrib. Petals 10–15 mm. long, anterior exceeding laterals. Stamens ten, unequal, two longer; anthers 6–8 mm. long, purple. Legumes 3–4.5 cm. long, 4–5 mm. wide, appressed-puberulent with an evident beak, 1–2 mm. long. Seeds six to nine, 3 mm. long.

Sandy soil, Staked Plains of northwestern Texas, southwestern Kansas and eastern New Mexico.

KANSAS. Morton: Richfield, *J. N. Rose 17169* ≷ September 20 (U).

TEXAS. Hemphill: Canadian, *A. H. Howell 87* > July (U). "Staked Plains," *G. W. Holstein* (A).

NEW MEXICO. Quay: Logan, *G. L. Fisher 93* > October 5 (U).

8. CHAMAECRISTA FASCICULATA (Michx.) Greene

Cassia fasciculata Michx. Fl. Bor. Amer. **1**: 262. 1803. "*Hab.* in Pensylvania et Virginia." Type not seen nor verified, but description sufficiently indicates this plant.

Chamaecrista fasciculata ["*fascicularis*"] Greene, Pittonia **3**: 242. 1897.

Chamaecrista bellula Pollard, Proc. Biol. Soc. Wash. **15**: 19. 1902. "Type in the United States National Herbarium, collected by Prof. S. M. Tracy at St. Vincent, Florida, September 9, 1899 (No. 6,326)." Type, collected September 4, 1899, seen in the United States National Herbarium. Perhaps a small-leaved form of the southern Coastal Plain.

Chamaecrista camporum Greene, Pittonia **5**: 108. 1903. "Type specimens collected by myself at Monticello, Illinois, 7 August, 1899." Type not seen nor verified, but description evidently of this species.

Cassia Chamaecrista L. (Sp. Pl. 379. 1753. "*Habitat in* Jamaica, Barbados, Virginia") is composite, and should be typified by "Chamae Crista pavonis americana, siliqua multiplici," Breyn. Cent. **66**: *pl. 24*, from Curaçao. This is the species usually known as *Cassia diffusa* DC., an ally of *C. nictitans* L. The Linnaean diagnoses, here, in Hort. Ups. 101, 1748, and in Hort. Cliff. 158, 1737, will apply to this, the phrase "glandula petioli pedicellata" directly excluding our plant.

Annual. Stem erect, 3–9 dm. tall, much branched, puberulent in lines with ascending incurved hairs. Stipules linear-attenuate, glabrous or nearly so, ciliate, many-nerved, 5–10 mm. long. Petioles 5–8 mm. long, puberulent with incurved hairs. Petiolar gland single, near middle or toward distal end of petiole, sessile or nearly so, depressed saucer-shaped, round or slightly oval, 0.5–1.5 mm. wide, dark brown to brown. Leaflets six to twelve (or fifteen) pairs, 10–20 mm. long, 2–5 mm. wide, oblong-linear, obtuse to acute, shortly mucronulate to mucronate, glabrous (rarely very finely puberulent), finely ciliolate, paler beneath, evidently nerved. Bracteoles 3–5 mm. long, linear-attenuate. Pedicels one to six in a fascicle, 10–20 mm. long, finely or sparsely puberulent with incurved (rarely somewhat spreading, then short) hairs. Sepals 9–12 mm. long, lanceolate-acuminate, more or less pubescent on the midrib. Petals 10–17 mm. long, anterior slightly exceeding laterals. Stamens ten, unequal, two longer; anthers 8–10 mm. long, yellow or reddish (especially southwestward). Legumes 4–5 cm. long, 5–5.5 mm. wide, appressed-puberulent or glabrate on the sides, with a beak usually short but reaching 1.5 mm. long. Seeds six to fifteen, 3–3.2 mm. long.

Moist to dry, usually sandy, open places, southeastern Massachusetts to Florida and central Texas, inland to northern Ohio, southern Minnesota and central Kansas. Abundant in many parts of the southeast, especially in the Atlantic Coastal Plain. Northeast of Virginia, rare above the Fall Line, on the Serpentine and occasionally elsewhere in southeastern Pennsylvania.

Variable, and doubtless hybridizes with allied species. Southeastward probably passes into the little-known variety γ southward through the lower Alleghenies and the lower Mississippi valley passes into the very pronounced variety β.

MASSACHUSETTS. Barnstable: Woods Hole, *T. Morong* > August 10 (Y); also Plymouth County.

RHODE ISLAND. Providence: East Providence, *J. F. Collins* > August 26 (U); also Washington County.

CONNECTICUT. Fairfield: Greens Farms, *C. L. Pollard 232* ≷ August 16 (U).

NEW YORK. Nassau: Long Beach, *F. W. Pennell 2312* ≷ October 12 (Y); also Bronx, Richmond, Suffolk and Westchester Counties.

NEW JERSEY. Cape May: Cape May, *F. W. Pennell 2223* > August 4 (U); also Atlantic, Bergen, Camden, Cumberland, Gloucester, Middlesex, Monmouth, Ocean, Passaic and Somerset Counties.

PENNSYLVANIA. Delaware: Williamson School (serpentine). *F. W. Pennell 1640* (Y); also Allegheny, Beaver, Berks, Chester, Dauphin, Huntingdon, Lancaster and Montgomery Counties.

DELAWARE. Sussex: Milton, *A. Commons* > August 17 (A).

MARYLAND. Cecil: Bacon Hill, *F. W. Pennell 1616* > August 4 (Y); also Dorchester and Queen Anne Counties.

VIRGINIA. Princess Anne: Virginia Beach, *T. H. Kearney 2136* < October 6 (U); also Accomac, Fairfax, Hanover, Norfolk and Warren Counties.

WEST VIRGINIA. Jefferson: Harpers Ferry, *Detwiller*, August 6 (A).

NORTH CAROLINA. Buncombe: Biltmore, *Biltmore herbarium 180b* > July 30 (P, U, Y); also Carteret, Cherokee, Craven, Forsyth, Orange, Polk and Rowan Counties.

SOUTH CAROLINA. Orangeburg: Eutawville, *W. W. Eggleston 4980* > September 6–11 (Y); also Aiken and Berkeley Counties.

GEORGIA. Chattooga: Summerville, *C. L. Pollard & W. R. Maxon 446* > August 7–8 (U). Gilmer: Ellijay, *J. K. Small* > August 13–16 (Y). Sumter: *R. M. Harper 1003* > July 5 (U, Y). Whitfield: Dalton, *R. M. Harper 396* > August 10 (U, Y).

FLORIDA. Franklin: St. Vincent (Id.), *S. M. Tracy 6326* < September 4 (U, Y).

ALABAMA. Clay: Talladega Creek, *C. Mohr* > August 1 (U). Dekalb: Mentone, *C. Mohr* ≷ September 2 (U). Jefferson: Bir-

mingham, *C. Schuchert* > October 9 (U, Y). Lee: Auburn,* *F. S. Earle & C. F. Baker* > August 17 (Y).

MISSISSIPPI. Carroll: *E. Smith* (U).

TENNESSEE. Chester: Henderson, *S. M. Bain 54 p.p* > August (Y). Knox: Knoxville, *A. Ruth 2202* > June (Y). Marion: South Pittsburg, *C. L. Pollard & W. R. Maxon 409* > August 3–4 (U, Y). Monroe: Madisonville, *F. L. Scribner* > August (U). Roane: Post Oak Springs, *C. L. Pollard & W. R. Maxon 413* > August 6 (U).

KENTUCKY. On Red River, *R. Peter* > July (Y).

OHIO. Erie: Oxford prairie, *E. L. Moseley* > August 6 (U).

INDIANA. Newton: Roselawn, *H. Hahn* (U).

ILLINOIS. Cook: Calvary,* *F. C. Gates* > August 21 (U); also Vermilion* County.

WISCONSIN: Trempeleau: Trempeleau, *T. J. Hale* (A).

MINNESOTA. Brown: Sleepy Eye, *E. P. Sheldon* > July (U, Y); also Houston and Nicollet Counties.

SOUTH DAKOTA. Minnehaha: Sioux Falls, *Thornber* > August (U).

IOWA. Story: Ames, *L. H. Pammel & C. R. Ball 20* > July 18 (U, Y); also Buchanan, Decatur, Fayette, Hardin and Johnson Counties.

NEBRASKA. Lancaster: Lincoln, *J. G. Smith* > September (C); also Cass County.

MISSOURI. Greene: Springfield, *P. C. Standley 8322* > August 28 (U). Jackson: Courtney, *B. F. Bush 6489* ≧ August 19 (U, Y). Marion: Oakwood, *J. Davis 302* > July 17 (U). Mississippi: Charleston, *O. Kuntze 2862* < September 9 (Y). St. Louis: St. Louis, *N. Riehl 87* > August (Y). Washington: Potosi, *F. Peck* (U).

KANSAS. Geary: Fort Riley, *E. E. Gayle 538* > July 20 (Y); also Douglas, Lyon, Riley and Shawnee Counties.

ARKANSAS. Miller: Texarkana, *A. A. & E. G. Heller 4133* > August 23 (A, U, Y) (leaflets minutely puberulent). Nevada: 4 m. se. of Prescott, *M. P. Hollister 25* > June 17 (U). Pulaski: Little Rock, *H. E. Hasse* (Y).

OKLAHOMA. Creek: Sapulpa, *F. W. Pennell 5392* > September 8 (P). Payne: Stillwater, *F. A. Waugh 358* (U).

* Approaching *C. fasciculata* β.

LOUISIANA. Caddo: Shreveport, *Gregg* > September 4 (A).

TEXAS. Hays: San Marcos and vicinity, *S. W. Stanfield* (Y). Parker: Weatherford, *S. M. Tracy 8026* > June 3 (P, Y). Travis: Austin, *F. W. Pennell 5430* > September 13 (P) (anthers purple). Walker: Huntsville, *R. A. Dixon 400* > July 9–12 (Y).

8*a*. CHAMAECRISTA FASCICULATA β

Cassia Chamaecrista robusta Pollard, Bull. Torrey Club **21**: 218. 1894. "Type a single specimen in the Columbia College Herbarium collected by Dr. C. W. Short in the mountains of Kentucky." Type seen in the herbarium of Columbia University at the New York Botanical Garden.

Cassia robusta Pollard, *l.c.* **24**: 150. 1897.

Chamaecrista robusta Pollard; Heller, Cat. N. A. Pl. 2d ed. 5. 1900.

Stem stouter, 6–15 dm. tall, more or less densely hirsute above with spreading hairs. Stipules lanceolate-attenuate, 10–14 mm. long. Petioles hirsute-pubescent. Leaflets nine to eighteen pairs, 15–20 mm. long, 3–6 mm. wide. Bracteoles 4–6 mm. long. Pedicels 15–25 mm. long, hirsute with spreading hairs. Sepals hirsute on the midrib. Petals 15–20 mm. long. Legumes 5–7 cm. long, 6–7 mm. wide, hirsute-pubescent. Otherwise as in the species.

Moist to dry soil, more frequently in low ground, and most abundant on alluvial soil, southern Ohio to northern Florida, eastern Missouri and Louisiana. Throughout the lower Mississippi valley, mostly in alluvial soil; also pushing up into the valleys of the southern Alleghenies. In southern Louisiana, where I have collected it, seemingly quite distinct from *C. fasciculata*, but study of specimens shows a surprising number of intermediates.

GEORGIA. Clarke: *R. M. Harper* > (Y). Floyd: Rome, *G. McCarthy 311* > July (U).

FLORIDA. Leon: Tallahassee, *N. K. Berg* (Y).

ALABAMA. Baldwin: Tensaw, *S. M. Tracy 8009, 8038* > August 22 (P, U, Y). Barbour: Eufaula, *G. McCarthy* > August (U). Clay: Delta, *C. Mohr* (U). Lee: Auburn, *F. S. & E. S. Earle 30* > September 14 (U, Y).*

* Approaching the typical form of the species.

MISSISSIPPI. Franklin: Florence, *E. G. Holt 17* > July 25 (U). Jasper: *S. Deavoms 2942* (U). Noxubee: Prairie Point, *Mrs. P. A. L. Carpenter* ≧ *October* (U). Oktibbeha: Agricultural College, *C. L. Pollard 1276* > August 11–17 (U, Y).

TENNESSEE. Chester: Henderson, *S. M. Bain 54 p.p.* > August (U, Y). Franklin: Cowan, *A. Ruth* > July (U).*

KENTUCKY. Lincoln: Crab Orchard, *C. W. Short* (A). "Mountains of Kentucky," *C. W. Short* (A, Y).

OHIO. "In ditione Miami," *Dr. Frank* (U).

ILLINOIS: Cass: Little Indian, *F. C. Gates* > July 7 (U). Peoria: Peoria, *F. E. McDonald* > September (Y). Richland: *R. Ridgway* (U).

MISSOURI. Polk: Graydon Springs, *P. C. Standley 9895* ≧ September 7 (U). St. Louis: St. Louis, *O. Kuntze 2773* > September 6 (Y).

ARKANSAS. Ouachita: Camden, *A. H. Howell 618* > July 7 (U).

LOUISIANA. Avoyelles: Marksville, *W. L. McAtee 2185* > September 12 (U). West Feliciana: Baines, *F. W. Pennell 4275* > August 21 (P, Y).

8*b*. CHAMAECRISTA FASCICULATA γ

Cassia depressa Pollard, Bull. Torrey Club **22**: 515. *pl. 25*. 1895.

"Low pine woods, River Junction, Gadsden Co., Florida. G. V. Nash, September 5, 1895 (no. 2571)." Type seen in the herbarium of Columbia University at the New York Botanical Garden.

Chamaecrista depressa Greene, Pittonia **3**: 242. 1897.

Stems spreading-ascending, slender, 1–3 dm. tall, diffusely branched below. Petioles 2–5 mm. long. Petiolar gland .3–1 mm. wide. Leaflets six to ten pairs, 8–12 mm. long, 2–3 mm. wide. Bracteoles 3–4 mm. long. Pedicels 1–3 in a fascicle, hirsute with spreading, and also in part with fine incurved hairs. Sepals 8–10 mm. long, hirsute on the midrib. Legumes spreading-pubescent. Otherwise as in the species. Not satisfactorily known, but certainly not a distinct species.

Open pine-woods, Apalachicola River hills, northwestern Florida.

FLORIDA. Gadsden: Chattahoochee, *S. M. Tracy 3956* >

August 23 (U, Y); River Junction, *A. H. Curtiss 5980* > September 8 (U, Y).

9. CHAMAECRISTA MISSISSIPPIENSIS (Pollard) Pollard

Cassia mississippiensis Pollard, Bull. Torrey Club **21**: 219. 1894. "Type in herbarium of Columbia College, collected by Miss K. Skeehan, 1889, at Ocean Springs, Mississippi." Type collected November 7, 1889, seen in the herbarium of Columbia University at the New York Botanical Garden. Several specimens on sheet; these, originally described as "suffruticose," are apparently lateral shoots of a dwarfed diffusely branched plant.

Chamaecrista mississippiensis Pollard; Heller, Cat. N. A. Pl. 2d ed. 5. 1900.

Chamaecrista Tracyi Pollard, Proc. Biol. Soc. Wash. **15**: 21. 1902. "Type in the United States National Herbarium, collected by Prof. S. M. Tracy at Koshtaw, Miss., September 15, 1898." Type, *Tracy 4914*, collected October 15, 1898, seen in the United States National Herbarium.

Annual. Stem erect or ascending, 2–6 dm. tall, slender, often diffusely branched at base, finely puberulent with ascending incurved hairs. Stipules lanceolate-attenuate, glabrous or nearly so, ciliate, 4–7 mm. long. Petioles 2–5 mm. long, puberulent with incurved hairs. Petiolar gland single, sessile, depressed saucer-shaped, .3–.6 mm. wide, dark-brown. Leaflets six to fifteen pairs, 5–12 mm. long, 2–3 mm. wide, ellipsoid linear-lanceolate, acutish to acute-mucronate, appressed-puberulent, not ciliate, obscurely nerved. Bracteoles 2–3 mm. long, linear-attenuate. Pedicels one to three in a fascicle, 6–15 mm. long, finely puberulent with incurved hairs. Sepals 5–10 mm. long (in the bud longer than the petals), linear-lanceolate, long-attenuate, appressed-puberulent. Petals 8–15 mm. long, anterior slightly exceeding laterals. Stamens ten, unequal, two longer; anthers 7–9 mm. long, yellow. Legumes 3–5 cm. long, 5 mm. wide, appressed-puberulent. Seeds six to fifteen.

Moist sandy pine-land, southern Mississippi and Louisiana, extending apparently into southern Alabama and southeastern Texas.

ALABAMA. Lee: Auburn, *F. S. Earle & C. F. Baker* > August (U).

MISSISSIPPI. Copiah: *L. R. Gibbes* > August (Y). Harrison: Biloxi, *F. W. Pennell 4378* > August 28 (P). Jackson: Scranton, *S. M. Tracy 4436* > August 29 (U).

LOUISIANA. Caddo: Shreveport, *F. S. Earle* > June (Y). Plaquemines: Breton Island, *S. M. Tracy & F. E. Lloyd 198 p.p.* > August 17 (P). Rapides: Alexandria, *C. R. Ball 540 p.p.* > June 3 (U, Y). St. Landry: Opelousas, *C. Mohr* > March 15 (U). St. Tammany: Abita Springs, *F. W. Pennell 4228* > August 16 (P, Y).

TEXAS. Harris: La Porte, *G. L. Fisher 643* > August 15 (U).

9*a*. CHAMAECRISTA MISSISSIPPIENSIS β

Chamaecrista littoralis Pollard, Proc. Biol. Soc. Wash. **15**: 20. 1902. "Type, No. 371,572 in the United States National Herbarium, collected by Prof. S. M. Tracy and Prof. F. E. Lloyd on Breton Island, La., August 17, 1900 (No. 198)." Type seen in the herbarium of the United States National Museum.

Stems mostly stouter, 4–8 dm. tall, erect. Leaflets 7–15 mm. long. Pedicels hirsute with spreading, sometimes also with shorter incurved hairs. Legumes hirsute-pubescent. Otherwise as in the species.

Sandy soil, in the Coastal Plain, mostly near the Gulf coast, on dunes and in pine-land, western Florida to eastern Texas.

FLORIDA. Wakulla: St. Marks, *F. Rugel* > June (Y).

ALABAMA. Mobile: Hollanders Island, *F. W. Pennell 4506* > September 2 (P, Y); Theodore, *F. W. Pennell 4444* > August 30 (P, Y).

MISSISSIPPI. Clarke: Shubuta, *C. Schuchert* > October 11 (U). Harrison: Cat Id., *F. E. Lloyd & S. M. Tracy 183* ≷ August 26 (U, Y). Jackson: Horn Id., *S. M. Tracy 6927* > July 14 (U). Wayne: Waynesboro, *C. L. Pollard 1217* > October 8–9 (U, Y).

LOUISIANA. Calcasieu: Lake Charles, *S. M. Tracy 3957* > August 7 (U). Plaquemines: Breton Island, *F. E. Lloyd & S. M. Tracy 198 p.p.* < August 17 (U, Y.).

TEXAS. San Augustine: San Augustine, *G. L. Crocket* (U).

10. CHAMAECRISTA PUBERULA Greene

Chamaecrista puberula Greene, Pittonia 5: 134. 1903. "On Galveston Island [Texas], 23 Sept. 1901 [S. M. Tracy]." Co-type of Tracy, *7797*, seen in the herbarium of the New York Botanical Garden.

Annual. Stem erect, 4–8 dm. tall, puberulent with ascending-incurved hairs. Stipules lanceolate-acuminate, nerved, puberulent, finely ciliate, 4–5 mm. long. Petioles 3–6 mm. long, puberulent with incurved hairs. Petiolar gland single, short-pediceled to sessile, discoid to slightly saucer-shaped, 0.5–1 mm. wide, dark-brown. Leaflets ten to fifteen pairs, 10–18 mm. long, 2–4 mm. wide, linear-lanceolate, acutish to acute-mucronate, densely puberulent, not ciliate, midrib evident, elsewhere obscurely nerved. Bracteoles 1–2 mm. long, lanceolate-ovate. Pedicels one to three in a fascicle, 5–20 mm. long, puberulent with incurved hairs. Sepals 6–8 mm. long (in the bud shorter than the petals), ovate-lanceolate, acute to short-acuminate, pubescent. Petals 10–15 mm. long, anterior slightly exceeding laterals. Stamens 10, unequal, 2 longer; anthers 4–5 mm. long, deep purple. Legumes 5–6 cm. long, 4–5 mm. wide, appressed-puberulent. Seeds eight to fourteen, 3.7–4 mm. long.

Moist to dry sandy soil, southern Texas.

TEXAS. Colorado: Sheridan, *F. W. Pennell 5538* > September 21 (P, Y). Dewitt: Cuero, *A. H. Howell 252* > July 7 (U). Galveston: Galveston, *F. W. Pennell 5574* > September 23 (P, Y). Lavaca: Hallettsville, *G. L. Fisher 126* ≧ August (U). Nueces: Kings Ranch, *V. Bailey 251* > May 10 (U). Robertson: Hearne, *F. W. Pennell 5418* > September 11 (P, Y). Webb: Laredo, *A. Schott 110* > June (Y). Wharton: Pierce, *S. M. Tracy 7796* > September 16 (U, Y), anther-sacs yellowish or reddish.

11. CHAMAECRISTA LEPTADENIA (Greenman) Cockerell

Cassia leptadenia Greenman, Proc. Amer. Acad. 41: 238. 1905. "48 km. east of El Paso, May to October, 1849, *Chas. Wright*, no. 154 (hb. Gray)." Co-type seen in the United States National Herbarium.

Chamaecrista leptadenia Cockerell, Muhlenbergia 4: 68. 1908.

Annual. Stem erect, slender, 1–5 dm. tall, sparingly branched, puberulent in lines with incurved to spreading hairs. Stipules

linear-attenuate, glabrous or nearly so, conspicuously ciliate, nerved, 5–7 mm. long. Petioles 2–5 mm. long, puberulent with incurved hairs. Petiolar gland single, stalked, discoid, 0.2–0.3 mm. wide, nearly black, stalk brown. Leaflets twelve to sixteen pairs, 8–12 mm. long, 1–2 mm. wide, oblong-linear, acutish, mucronate-tipped, glabrous, strongly ciliate, obscurely nerved. Bracteoles 1–1.7 mm. long, lanceolate. Pedicels one or two in a fascicle, 3–5 mm. long, appressed-puberulent. Sepals 4–5 mm. long, lanceolate, acuminate, hirsute. Petals 3–6 mm. long, anterior twice exceeding laterals. Stamens unequal; anthers 2 mm. long, yellow (?). Legumes 3–4.2 cm. long, 3–4 mm. wide, appressed-puberulent. Seeds ten to eighteen, 3 mm. long, very thin, light-brown.

Dry soil, western Texas to southeastern Arizona.

TEXAS. El Paso: *C. Wright 154* (U). Presidio: Chenates region, *G. C. Nealley 541* (U).

NEW MEXICO. Dona Ana: Organ Mountains, *E. O. Wooton 435* < September 1 (Y). Luna: Floridas, *A. I. Mulford 1038a* > August 2 (Y).

ARIZONA. Cochise: Bowie; Chiricahua Mts., *J. C. Blumer 2086* > August 30 (U); Fort Huachuca; Tucson. Pima: Santa Rita Mountains, *D. Griffiths & J. J. Thornber 212* (U, Y).

12. CHAMAECRISTA NICTITANS (L.) Moench

Cassia nictitans L. Sp. Pl. 380. 1753. "*Habitat in* Virginia." Typified by L. Hort. Cliff. 497. *pl. 36*, 1737, where an excellent description and figure are given.

Cassia procumbens L. *l.c.* 380. 1853. "*Habitat in* Indiis." Based wholly upon "Cassia americana procumbens, herbacea, mimosae foliis, floribus parvis, siliquis angustis, planis," A. J. A[mmann], Comm. Petrop. **12**: 238–242 (cited erroneously by Linnaeus as "Comm. petrop. t. 11"). This is fully described and is unquestionably *Chamaecrista nictitans* (L.) Moench. The type-locality is stated "circa Philadelphiam urbem in Pensylvania, Americae septentrionalis provincia, sitam." There appears to have been no specimen in the Linnean herbarium in 1753, and the species is not checked by Linnaeus until his third list in 1767. The West Indian plant known until recently by this name has been described by Dr.

Britton as *Chamaecrista micrantha* Britton, Bull. Torrey Club **43**: 463. O 20 1916.

Chamaecrista nictitans Moench, Meth. 272. 1794.

Nictitella amena Raf. Sylv. Tellur. 128. 1838. New name for *Cassia nictitans* L., type of the genus *Nictitella* Raf.

Cassia Chamaecrista nictitans Kuntze, Rev. Gen. Pl. **1**: 169. 1891.

Chamaecrista nictitans commixta Pollard & Maxon, Proc. Biol. Soc. Wash. **14**: 163. 1901. "Type in U. S. National Herbarium, No. 357,069, collected by Charles L. Pollard and William R. Maxon in alluvial soil along the New River at Quinnimont, W. Va., August 21, 1899 (No. 31)." Type seen in the United States National Herbarium.

Cassia nictitans commixta Millsp. W. Va. Geol. Surv. **5**: 283. 1913.

Annual. Stem erect, 1–4 dm. tall, much branched, puberulent with incurved hairs. Stipules lanceolate-attenuate, glabrous or nearly so, ciliate, nerved, 5–8 mm. long. Petioles 4–9 mm. long, puberulent with incurved hairs. Petiolar gland single, shortly below proximal leaflets, stalked, discoid or nearly so, 0.3–0.8 mm. wide, dark-brown. Leaflets nine to eighteen pairs, 7–15 mm. long, 2–4 mm. wide, oblong-linear, obtuse, mucronate, glabrous, not ciliate, paler beneath, obscurely nerved. Bracteoles 1.5–2 mm. long, lanceolate. Pedicels one to two or three in a fascicle, 2–4 mm. long, appressed-puberulent. Sepals 3–4 mm. long, lanceolate, acuminate, puberulent on the midrib. Petals 3–8 mm. long, anterior twice exceeding laterals. Stamens unequal, five; anthers 2 mm. long, pinkish. Legumes 2.5–4 cm. long, 4–6 mm. wide, appressed-pubescent. Seeds six to nine, 3 mm. long, thick, dark-brown.

Sandy soil, or sterile soil, frequently along roadsides, probably near the borders of its range introduced, southern Vermont and Rhode Island, to eastern Kansas, Georgia and Texas.

VERMONT. Windham: Vernon, *A. J. Grout* > August 6 (U).

RHODE ISLAND. Providence: Elmwood, J. F. Collins > August 25 (U).

CONNECTICUT. Fairfield: Bridgeport, *E. H. Eames* < September 14 (U).

NEW YORK. Westchester: Mount Kisco, *F. W. Pennell 6713* < September 26 (Y); also Albany, Bronx, Orange, Putnam, Queens, Rensselaer, Richmond and Suffolk Counties.

NEW JERSEY. Bergen: Alpine, *F. W. Pennell 6532* < September 12 (Y); also Atlantic, Burlington, Camden, Cape May, Gloucester, Middlesex, Morris, Ocean and Sussex Counties.

PENNSYLVANIA. Chester: Unionville, *F. W. Pennell 992* < October 3 (A); also Beaver, Berks, Bucks, Delaware, Lancaster, Lehigh, Montgomery, Northampton and Philadelphia Counties.

DELAWARE. Sussex: Milton, *A. Commons* > August 17 (A); also Kent and Newcastle Counties.

MARYLAND. Queen Anne: *E. G. Vanatta* > August 29 (A).

VIRGINIA. Augusta: Staunton, *W. A. Murrill* < September 5 (Y); also Botetourt, Hanover, and Princess Anne Counties.

WEST VIRGINIA. Fayette: Quinnimont, *C. L. Pollard & W. R. Maxon 31, 39* ≷ August 21 (U, Y); also Ritchie County.

NORTH CAROLINA. Buncombe: Biltmore, *Biltmore Herbarium 181b* > August 14, < September 28 (P, U, Y); also Cherokee, Craven, Haywood, Iredell, Orange, Polk and Swain Counties. Pasquotank: Elizabeth City, *F. L. J. Boettcher 291* > August 26 (U, Y) (leaflets but 6–7 mm. long and pubescence of upper part of stem spreading; perhaps a coastal form).

SOUTH CAROLINA. Pickens: Six Mile Creek, *H. D. House 3078* < October 22 (U).

GEORGIA. Chattooga: Summerville, *C. L. Pollard & W. R. Maxon 435* > August 7–8 (U). DeKalb: Stone Mountain, *C. L. Pollard & W. R. Maxon 463* > August 10–12 (U). Whitfield: Dalton, *R. M. Harper 395* > August 10 (U, Y).

ALABAMA. Clay: Elders, *C. Mohr* > July 30 (U). Dekalb: Mentone, *C. Mohr* > September 1 (U). Lee: Auburn, *F. S. Earle* > September 12 (Y).

MISSISSIPPI. Claiborne: Martin, *J. W. White 2944* > September 12 (U). Oktibbeha: Starkville, *S. M. Tracy 1422* < September 1 (U, Y).

TENNESSEE. Knox: Knoxville, *A. Ruth 291* ≷ August (Y).

KENTUCKY. Bell: Pine Mt., *T. H. Kearney 496* < September (U); also Lyon County.

OHIO. Fairfield: Lancaster, *W. A. Kellermann* > August 18 (U).

INDIANA. Lake: Tolleston, *V. H. Chase 298* < September 23 (A).

ILLINOIS. Henderson: Oquawka, *H. N. Patterson* (U).

MISSOURI. Barry: Eagle Rock, *B. F. Bush 44* < September 28 (U, Y); also Greene, St. Louis and Scott Counties.

KANSAS. Cherokee: *A. S. Hitchcock 668* (U, Y).

ARKANSAS. Benton: *E. N. Plank* (Y). Pulaski: Little Rock, *H. E. Hasse* > August 26 (Y).

OKLAHOMA. Le Flore: "9 m. west of Fort Smith," *J. M. Bigelow* (U).

LOUISIANA. Rapides: Alexandria, *J. Hale* (Y). West Feliciana: Catalpa, *F. W. Pennell 4278* > August 21 (P, Y).

TEXAS. Burnet: Marble Falls, *E. N. Plank* > August 10 (Y).

12*a*. CHAMAECRISTA NICTITANS β

Cassia multipinnata Pollard, Bull. Torrey Bot. Club **22**: 515. *pl. 250*. 1895. No type indicated, and first specimen listed, Curtiss 712 (cited as "512"), is composite, consisting of plant described and in part of *Chamaecrista aspera*. Second specimen cited, "Near Jacksonville, A. H. Curtiss, North American Plants . . . second distribution, No. 5157, September 15, and October 27, 1894," is taken as the type. Type seen in the herbarium of the United States National Museum.

Cassia multipinnata Nashii Pollard, *l.c.* 515. 1895. "Collected in low pine woods, River Junction, Gadsden Co., Florida, by Mr. Nash, Sept. 5, 1895 (2577)." Type seen in the herbarium of the New York Botanical Garden.

Chamaecrista multipinnata Greene, Pittonia **3**: 243. 1897.

Stem 1–5 dm. tall. Stipules linear-attenuate. Leaflets fifteen to twenty-six pairs, 1–2 mm. wide. Legumes 4–5 mm. wide. Seeds six to twelve. Otherwise as in the species.

Sandy soil, in the Coastal Plain, especially in the pine-land, South Carolina to southern Mississippi. In the long-leaf pine-land replacing the species, of which it may be no more than an ecological form.

SOUTH CAROLINA. Aiken: Aiken, *H. W. Ravenel* (U).

GEORGIA. Bibb: Macon, *J. M. Green* (A). Brooks: Quitman, *R. M. Harper 1632* > September 13 (U, Y). Burke: *M. H. Hopkins 19* > September 9 (Y). Sumter: Americus, *S. M. Tracy 3958* > August 20 (U).

FLORIDA. Alachua: Gainesville, *H. S. Fawcett* < November (P). Duval: Jacksonville, *A. H. Curtiss 5157* > September 15 (U). Gadsden: River Junction, *G. V. Nash 2577* > September 5 (A, Y). Leon: Tallahassee, *G. V. Nash 2403* > August 12 (U, Y). Wakulla: St. Marks, *F. Rugel 199* > September (U).

ALABAMA. Baldwin: Daphne, *C. Mohr* > August 18 (U), Cullman: Ryans Creek, *C. Mohr* < August 6 (U). Lee: Auburn. *C. F. Baker 31* < October 10 (Y). Mobile: Theodore, *F. W. Pennell 4445* > August 30 (P, Y).

MISSISSIPPI. Clarke: Shubita, *C. Schuchert* < October 11 (U). Harrison: Pass Christian, *F. W. Pennell 4362* > August 27 (P, Y). Jackson: Ocean Springs, *S. M. Tracy 4434* > August 20 (U). Simpson: Saratoga, *S. M. Tracy 8505* > August 6 (P, U, Y).

12*b*. CHAMAECRISTA NICTITANS γ

Cassia aspera Mohrii Pollard, Bull. Torrey Club **24**: 151. Mar. 30, 1897. "Type in the herbarium of the U. S. Geol. Surv. of Alabama, collected in Mobile in 1878 by Dr. Mohr." Probable co-type, lacking statement of date, seen in the United States National Herbarium.

Chamaecrista aspera Mohrii Pollard; Heller, Cat. N. Am. Pl. 2d ed. 5. Nov. 10, 1900.

Stem 3–5 dm. tall, densely puberulent to spreading-pubescent. Stipules more ciliate, 8–10 mm. long. Leaflets 18–23 pairs, 9–12 mm. long, 2 mm. wide, narrowly oblong-linear, acute, strongly mucronate-tipped, pubescent with incurved hairs. Sepals hirsute-pubescent, especially on midrib. Legumes more hirsute. Otherwise as in the species.

Sandy soil in the Coastal Plain, southern Georgia to Louisiana and southern Arkansas. Insufficiently known, but probably not specifically distinct.

GEORGIA. Decatur: *E. A. Smith* (U).

ALABAMA. Mobile: Mobile, *C. Mohr* (U).

ARKANSAS. Miller: Texarkana, *A. A. & E. G. Heller 4134* > August 23 (A, U, Y).

LOUISIANA. Caddo: Shreveport, *Gregg* > September 6 (U). Rapides: Alexandria, *J. Hale* (Y).

13. CHAMAECRISTA ASPERA (Muhl.) Greene

Cassia aspera Muhl.; Ell. Bot. S. C. & Ga. 1: 474. 1821. "On Eding's island near Beaufort [South Carolina], common." Type not seen nor verified, but description sufficiently indicates this plant.

Nictitella aspera Raf. Sylv. Tell. 128. 1838.

Chamaecrista aspera Greene, Pittonia 3: 243. 1897.

Annual. Stem erect, 3–7 dm. tall, branched, strigose-hirsute with spreading hairs, below mostly also puberulent with some shorter incurved hairs. Stipules lanceolate-attenuate, conspicuously ciliate, nerved, 8–11 mm. long. Petioles 2–5 mm. long, hirsute, as well as the rachis, with spreading hairs. Petiolar gland single, shortly below proximal leaflets, stalked, truncate, scarcely wider than the stalk, 0.15–0.25 mm. wide, brown or dark-brown. Leaflets fifteen to twenty-seven pairs, 8–15 mm. long, 1.5–2 mm. wide, narrowly oblong-linear, acute, strongly mucronate, glabrous, not ciliate, slightly glaucous beneath, obscurely nerved. Bracteoles 1.5–2 mm. long, lanceolate. Pedicels one to two or three in a fascicle, 3–4 mm. long, appressed-puberulent. Sepals 3–5 mm. long, lanceolate, acuminate, strigose-hirsute on the midrib. Petals 3–7 mm. long, anterior nearly or twice exceeding laterals. Stamens unequal, seven to nine; anthers 2 mm. long, "yellow." Legumes 1.5–2.5 cm. long, 4–5 mm. wide, strigose-hirsute. Seeds three to eight, 2.5 mm. long, 2 mm. wide, thick.

Sandy soil, hammocks, fields or in pine-land, peninsular Florida, extending northward along the Atlantic coast to southern South Carolina.

FLORIDA. Dade: Miami, *N. L. Britton 456* > April 4 (Y). Duval: Jacksonville, *A. H. Curtiss 5158* > September 19 (U, Y). Hillsboro: Tampa, *N. L. Britton & P. Wilson 82* > August 25 (Y). Lake: Eustis, *G. V. Nash 1717* > August 16–25 (A, U, Y). Lee: Alva, *A. S. Hitchcock 56* (U, Y). Manatee: Perico Id., *S. M. Tracy 7244* > May 14 (U, Y). Monroe: Key West, *Blodgett* (U, Y). Orange: Clarcona, *M. Meislahn 35* > September 19 (U). Pinellas: St. Petersburg, *Mrs. C. C. Deam 2751* > September 18 (U, Y).

13*a*. CHAMAECRISTA ASPERA β

Cassia Simpsoni Pollard, Bull. Torrey Club 21: 221. 1894. "Florida—Big Pine Key, Simpson (May, 1891), No. 174.

Type, three specimens in the National Herbarium, collected by Mr. J. H. Simpson." Type seen in the United States National Herbarium.

Chamaecrista Simpsoni Pollard; Heller, Cat. N. A. Pl. 2d ed. 5. 1900.

Stem spreading, 1–3 dm. tall, diffusely branched, puberulent with incurved hairs below or throughout, hirsute with longer hairs only above or rarely throughout. Leaflets 9–19 pairs, 5–11 mm. long. Pedicels 2–3 mm. long.—Otherwise as in the species, with which it seems to completely intergrade. Pine-lands, extreme southern Florida.

FLORIDA. Dade: Cocoanut Grove, *N. L. Britton 285* ≷ March 26 (Y); Fort Dallas; Homestead; Miami. Monroe: Big Pine Key, *F. W. Pennell 9554* ≷ May 2 (Y); Boca Chica, *F. W. Pennell 9613* > May 15 (Y); Cudjoe, *F. W. Pennell 9556* ≷ May 5 (Y); Key West; Little Pine Key; No Name Key.

INDEX TO AMERICAN BOTANICAL LITERATURE

1916-1917

The aim of this Index is to include all current botanical literature written by Americans, published in America, or based upon American material; the word America being used in the broadest sense.

Reviews, and papers that relate exclusively to forestry, agriculture, horticulture, manufactured products of vegetable origin, or laboratory methods are not included, and no attempt is made to index the literature of bacteriology. An occasional exception is made in favor of some paper appearing in an American periodical which is devoted wholly to botany. Reprints are not mentioned unless they differ from the original in some important particular. If users of the Index will call the attention of the editor to errors or omissions, their kindness will be appreciated.

This Index is reprinted monthly on cards, and furnished in this form to subscribers at the rate of one cent for each card. Selections of cards are not permitted; each subscriber must take all cards published during the term of his subscription. Correspondence relating to the card issue should be addressed to the Treasurer of the Torrey Botanical Club.

Arny, L. W. Breeding for atropine. Jour. Heredity **8**: 164–167. *f. 6.* Ap 1917.

Bailey, L. H. The Standard Cyclopedia of Horticulture **6**: i–v+3043–3639. *pl. 101–120+f. 3516–4056.* 1917.

Berry, E. W. Contributions to the Mesozoic flora of the Atlantic coastal plain, XII—Arkansas. Bull. Torrey Club **44**: 167–190. *pl. 7.* 16 Ap 1917.

Dewalquea insigniformis and *Menispermites integrifolia*, spp. nov., are described.

Berry, E. W. A middle Eocene member of the "Sea Drift." Am. Jour. Sci. **43**: 298–300. *f. 1.* Ap 1917.

Berry, E. W. Notes on the history of the willows and poplars. Plant World **20**: 16–28. *f. 1.* Ja 1917.

Bethel, E. *Puccinia subnitens* and its aecial hosts. Phytopathology **7**: 92–94. Ap 1917.

Boynton, K. R. *Buddleia Davidi.* Addisonia **2**: 9, 10. *pl. 45.* 31 Mr 1917.

Brandegee, T. S. Plantae mexicanae purpusianiae.—VIII. Univ. Calif. Publ. Bot. **6**: 363–375. 23 Mr 1917.

Includes description of thirty new species.

Britton, E. G. A schedule for Arbor Day compositions on conservation. Nature-Study Rev. **13**: 140–142. Ap 1917.

Britton, N. L. *Peperomia obtusifolia*. Addisonia **2**: 19, 20. *pl. 50*. 31 Mr 1917.

Buchanan, R. E. Studies in the nomenclature and classification of the bacteria. II. The primary subdivisions of the Schyomycetes. Jour. Bacteriology **2**: 155–164. Mr 1917.

Burkholder, W. H. The perfect stage of *Gloeosporium venetum*. Phytopathology **7**: 83–91. *f. 1–3*. Ap 1917.
Includes descriptions of *Plectodiscella veneta* sp. nov.

Buscalioni, L., & Muscatello, G. Studio anatomo-biologico sul Gen. "Saurauia" Willd. con speciale riguardo alle specie americane. Malpighia **27**: 325–356. 1916.

Buscalioni, L., & Muscatello, G. Studio monografico sulle Specie Americane del Gen. "Saurauia" Willd. Malpighia **27**: 293–324. 1916; 487–502. 1916.

Chase, A. Rev. E. J. Hill. Rhodora **19**: 61–69. 17 Ap 1917. [Portrait.]

Conn, H. J. Soil flora studies. Part II. Jour. Bacteriology **2**: 137–154. Mr 1917.

Cook, M. T. Report of the department of plant pathology. New Jersey Agr. Exp. Sta. **1915**: 365–394. *pl. 1–5*. 1916.

Coville, F. V. How plants wake up from winter sleep. Nature-Study Rev. **13**: 143–147. Ap 1917. [Illust.]

Davidson, J. Selective permeability and the plasma-membrane. Plant World **19**: 331–394. N 1916.

Elliott, J. A. The sweet potato "soil rot" or "pox," a slime mold disease. Delaware Agr. Exp. Sta. Bull. 114: 1–25. *pl. 1–5* + *f. 1–13*. N 1916.

Evans, A. W. Notes on the genus *Herberta*, with a revision of the species known from Europe, Canada and the United States. Bull. Torrey Club **44**: 191–222. *pl. 8* + *f. 1–29*. 16 Ap 1917.
Includes *Herberta Hutchinsiae*, and *H. tenuis*, spp. nov.

Fernald, M. L. Two new maritime plants of northeastern North America. Rhodora **19**: 76. 17 Ap 1917.

Fernald, M. L. The variations of *Polygonum pennsylvanicum*. Rhodora **19**: 70–73. 17 Ap 1917.

Fitzpatrick, H. M. The development of the ascocarp of *Rhizina undulata* Fr. Bot. Gaz. **63**: 282–296. *pl. 17, 18*. 16 Ap 1917.

Fred, E. B., & Graul, E. J. The gain in nitrogen from growth of legumes on acid soils. Wisconsin Agr. Exp. Sta. Research Bull. 39: 1–42. *pl. 1, 2+f. 1–16.* O 1916.

Galloway, B. T. Newton B. Price. Phytopathology **7**: 143, 144. Ap 1917.

Gates, R. R. A revision of the genus *Polygonatum* in North America. Bull. Torrey Club **44**: 117–126. *pl. 4–6.* 27 Mr 1917

Greenman, J. M. Monograph of the North and Central American species of the genus *Senecio*—Part II. Ann. Missouri Bot. Gard. **4**: 15–36. *pl. 4.* F 1917.

Four new species are described.

Hansen, A. A. Natural dwarfing. Jour. Heredity **8**: 160–162. *f. 4, 5.* Ap 1917.

Harper, R. M. Some undescribed prairies in northeastern Arkansas. Plant World **20**: 58–61. *f. 1, 2.* F 1917.

Harrington, W. H. Notes on some Ottawa district plants. Ottawa Nat. **30**: 133–143. F 1917.

Harris, J. A. The application of correlation formulae to the problem of varietal differences in disease resistance: data from the Vermont experiments with potatoes. Am. Nat. **51**: 238–244. Ap 1917.

Harvey, R. B. A method for producing conductivity water suitable for water culture experiments. Bot. Gaz. **63**: 321, 322. *f. 1.* 16 Ap 1917.

Herrera, A. L., & Nuñez, A. S. Nuevas observaciones acerca de la siliza caloide solidificada. Bol. Dir. Estud. Biol. **1**: 632–636. *f. 1–3.* S 1916.

"Estructuras de diatomeas y de trejidos vegetales."

Humphrey, H. B. *Puccinia glumarum.* Phytopathology **7**: 142, 143. Ap 1917.

Jones, D. F. Dominance of linked factors as a means of accounting for heterosis. Proc. Nat. Acad. Sci. **3**: 310–312. 15 Ap 1917.

Jones, L. R. Lightning injury to kale. Phytopathology **7**: 140–142. *f. 1.* Ap 1917.

Kenoyer, L. A. Environmental influences on nectar secretion. Bot. Gaz. **63**: 249–265. 16 Ap 1917.

Kligler, I. J. The evolution and relationship of the great groups of bacteria. Jour. Bacteriology **2**: 165–176. Mr 1917.

Lee, H. A. A new bacterial citrus disease. Jour. Agr. Research **9**: 1–8. *pl. A 1, 2.* 2 Ap 1917.

Lindstrom, E. W. Linkage in maize: aleurone and chlorophyll factors. Am. Nat. **51**: 225–237. Ap 1917.

Lipman, C. B., & Gericke, W. F. Experiments on the effects of constituents of solid smelter wastes on barley growth in pot cultures. Univ. Calif. Publ. Agr. Sci. 1: 495–587. 26 Mr 1917.

Livingston, B. E. A quarter-century of growth in plant physiology. Plant World **20**: 1–15. Ja 1917.

Lloyd, C. G. Mycological notes—No. 45: 622–636. *f. 883–909* + *portrait.* Ja 1917.

Contains notes on rare species of fungi received from correspondents.

Lloyd, C. G. Mycological notes—No. 46: 638–652. *f. 910–932* + *portrait.* F 1917.

Includes notes on the genera *Mesophellia, Diploderma, Arachnion,* the *Xylarias,* etc.

Lloyd, C. G. Synopsis of some genera of the large Pyrenomycetes. 1–15. *f. 826–857.* Cincinnati. Ja 1917.

Camillea, Thamnomyces and *Engleromyces.*

MacCaughey, V. An annotated list of the forest trees of the Hawaiian Archipelago. Bull. Torrey Club **44**: 145–157. 27 Mr 1917.

MacCaughey, V. The genus *Artocarpus* in the Hawaiian Islands. Torreya **17**: 33–49. 17 Ap 1917.

MacCaughey, V. The orchids of Hawaii. Plant World **19**: 350–355. N 1916.

Mains, E. B. Species of *Melampsora* occurring upon *Euphorbia* in North America. Phytopathology **7**: 101–105. Ap 1917.

Melampsora monticola sp. nov. is described.

Mattoon, W. R. *Pinus caribaea:* an extension of range in Louisiana. Torreya **17**: 49–52. *f. 1, 2.* 17 Ap 1917.

Matz, J. A *Rhizoctonia* of the fig. Phytopathology **7**: 110–117. *pl. 2* +*f. 1–3.* Ap 1917.

Rhizoctonia microsclerotea sp. nov.

McCubbin, W. A. Contributions to our knowledge of the white pine blister rust. Phytopathology **7**: 95–100. *f. 1.* Ap 1917.

Metcalf, F. P., & Griscom, L. Notes on rare New York state plants. Rhodora **19**: 48–55. Mr. 1917.

Millspaugh, C. F. *Trichosterigma benedictum.* Addisonia **2**: 3, 4. *pl. 42.* 31 Mr 1917.

Nash, G. V. *Avelia grandiflora.* Addisonia **2**: 17, 18. *pl. 49.* 31 Mr 1917.

Nash, G. V. *Benthamia japonica.* Addisonia **2**: 5, 6. *pl. 43.* 31 Mr 1917.

Nash, G. V. *Gongora truncata alba.* Addisonia **2**: 11, 12. *pl. 46.* 31 Mr 1917.

Nash, G. V. Hardy woody plants in the New York Botanical Garden. Jour. N. Y. Bot. Gard. **18**: 65–68. Mr 1917.

Newman, L. E. The blister rust of white pine. Biltmorean **4**: 1–9. *f. 1–6.*

Noriega, J. M. Les plantas mexicanas. Bol. Dir. Estud. Biol. **1**: 641–683. *f. 1–15.* S 1916.

Orton, C. R. Diseases of the apple, pear and quince. Proc. Pennsylvania State Hort. Assoc. 1916: 45–52. *f. 1–7.* 1916.

Orton, C. R. Diseases of the brambles and methods of controlling them. Proc. Pennsylvania State Hort. Assoc. 1916: 66–71. *f. 1–7.* 1916.

Osterhout, W. J. V. Does the temperature coefficient of permeability indicate that it is chemical in nature? Bot. Gaz. **63**: 317–320. 16 Ap 1917.

Pember, F. R. Studies by means of both pot and solution culture of the phosphorus and potassium requirements of the barley plant during its different periods of growth. Rhode Island Agr. Col. Exp. Sta. Bull. 169. 1–50. *pl. 1, 2 + f. 1–3.* Ja 1917.

Pickett, F. L. Is *Pellaea glabella* Mett. a distinct species. Am. Fern Jour. **7**: 3–5. Mr 1917.

Praeger, R. L. Some new species of *Sedum.* Jour. Bot. **55**: 38–44. F 1917.

Includes *Sedum griseum* and *S. amecamecanum* from America.

Pring, G. H. Hybrid Nymphaeas. Ann. Missouri Bot. Gard. **4** 1–14. *pl. 1–3 + f. 1–5.* F 1917.

Rankin, W. H. White pine blister rust. Tree Talk **4**: 77, 78. Fig. 17.

Reed, E. L. Leaf nectaries of *Gossypium.* Bot. Gaz. **63**: 229–231. *pl. 12, 13 + f. 1.* 15 Mr 1917.

Ridlon, H. C. *Onoclea sensibilis* forma *obtusilobata.* Am. Fern Jour. **7**: 6. F 1917.

Notes and illustrations by C. A. Weatherly follow on pages 6–9.

Rojas Acosta, N. Addenda ad floram Chaco Australis (1909). Bull. Géog. Bot. **23**: 211–219. 1914.

New species in *Trophisomia* (1), *Maclura* (1), *Aristolochia* (1), *Labatia* (3), *Basanacantha* (1), *Begonia* (1), *Myrcialencus* (1), *Platorheedia* (1).

Rosenbaum, J. Studies of the genus *Phytophthora*. Proc. Nat. Acad. Sci. **3**: 159–163. 15 Mr 1917.

Safford, W. E. *Lignum nephriticum*—its history and an account of the remarkable fluorescence of its infusion. Smithsonian Rep. **1915**: 271–298. *pl. 1–7*. 1916.

Sanders, J. G. Save us from invading pests. Am. Forest. **23**: 147–153. Mr 1917. [Illust.]

Sargent, C. S. Botanical activities of Percival Lowell. Rhodora **19**: 21–24. 14 F 1917.

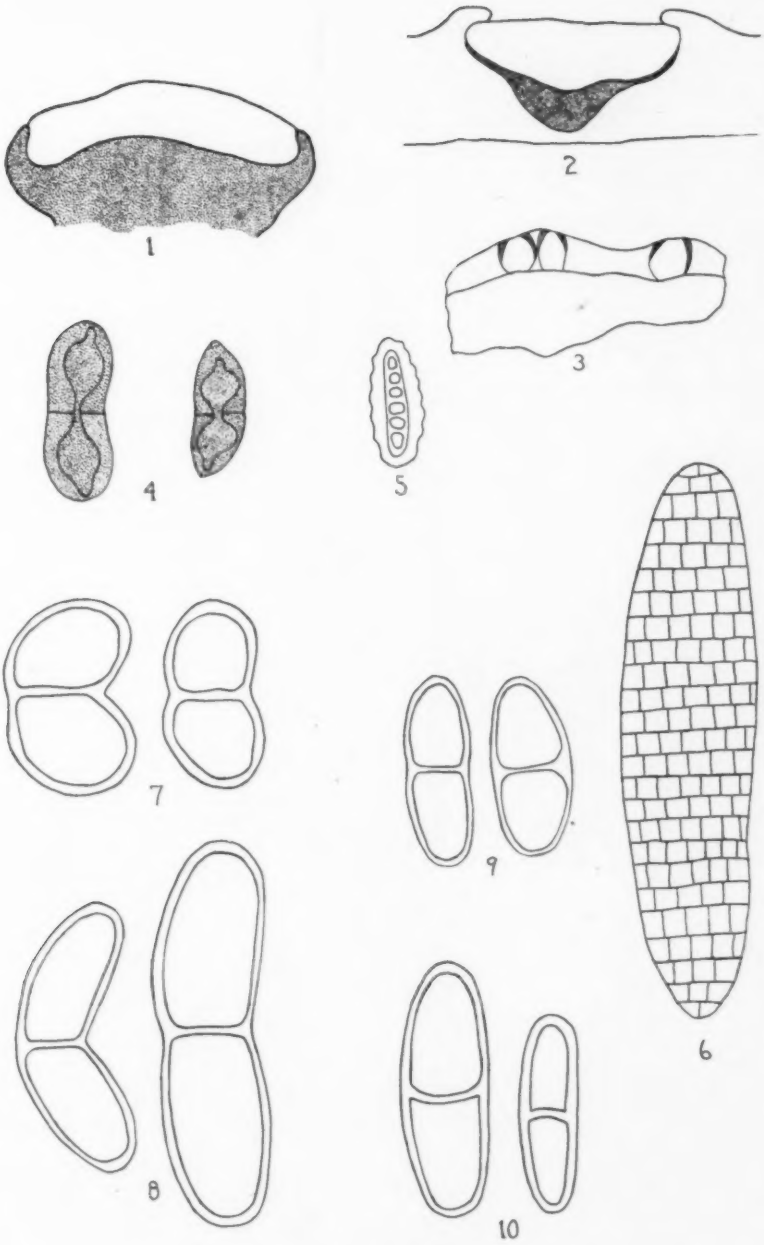
Seaver, F. J. Photographs and descriptions of cup-fungi—V. *Discina venosa*. Mycologia **9**: 53, 54. *pl. 5*. 22 Mr 1917.

Shufeldt, R. W. Early spring and summer flowers. Am. Forest. **26**: 161–165. *f. 1–6*. Mr 1917. [Illust.]

Wiggans, R. G. The number of temporary roots in the cereals. Jour. Am. Soc. Agron. **8**: 31–37. *pl. 1*. 1 F 1916.

Wille, N. Om Udbredelsen af *Artemisia norvegica* Fr. Bot. Not. **1916**: 133–137. 1916.

Winslow, E. J. Rev. James A. Bates. Am. Fern Jour. **7**: 1–3. Mr 1917. [Portrait.]



RIDDLE: NOTEWORTHY LICHENS FROM JAMAICA

GONIOPTERIS CLAIBORNIANA BERRY